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POPULAR Computing WEEKLY

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Vol 5 No 27

Commodore to clash with Atari



Souped-up 68000 machines due from Atari and Commodore this Autumn
Both machines will have massively increased memory and processing power
Sound and graphics industries targeted by Commodore

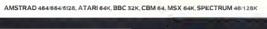
Full details below and inside

COMMODORE and Atari are set for a head-to-head confrontation this Autumn as both companies plan souped-up versions of their 68000 processor machines

Prototype versions of Commodore s Amiga 2 which features a full 68020 processor and improved blitter and sound. are already thought to be in circulation in the United States with an announcement of the machine predicted for September, while Atari is also working on a 68020 machine with a built-in blitter chip

In Atari s case the new machine will move in at the top of the range, leaving cheaper versions of the ST to sell into mass markets while the more powerful model is used for specialised graphic and sound tasks Commodore's current version of the Amiga is however too expensive for this to be an option and the Amiga 2 is

Continued on page 4 ▶







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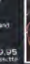
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Contents

◀HARDWARE



Some of our features are missing

Apologies to those of you looking for the Amstrad supplement this week. Unfortunately, it was a casualty of technical difficulties and all things being equal will appear next week

◀SOFTWARE

GAMES▶

◀PROGRAMMING

REGULARS▶

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ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

News Desk

QL pressure group formed

QL RESCUE plans received a shot in the arm last week after an information seminar organised by the magazine *QL World* at the instigation of Colin Hughes of Transform. The seminar was attended by representatives of companies from France, Italy, Denmark, the United States, Holland and the UK, and Hughes was voted chairman of a new pressure group to market the QL.

It'll be called the Independent QL Suppliers Group or something, says Hughes but he intends to issue a press statement outlining the group's plans by the end of this week.

In the short term the group will attempt to maintain interest in the machine, possibly in conjunction with CST's Thor upgrade but in the longer term if the machine is to survive it will be necessary for someone to buy the rights to it from Amstrad. The CST Thor is now being marketed by Eidersoft and according to an Eidersoft spokesman the machine is now to be marketed as "the ultimate QL add-on". It appears that any plans to restart production of QL circuit boards and to base the machine on these, have been abandoned.

There are however, abundent supplies of QLs at the moment, and although export distributor PST's deal with Amstrad means it can only sell its 20 000 outside the UK other companies have sufficient stocks in both component and assembled form.

CST hopes to sell 5-10 000 Thors but the fact that the



The QL. Abundant supplies for upgrade

machine has a $3\frac{1}{2}$ inch disc drive and no Microdrive is concerning some software houses. Veronica Cullen, who attended the seminar for Talent was doubtful over the economics of software houses going over to disc for this sort of volume, and similar volumes for later machines wouldn't help much either. "It's going to be expensive to support the QL compatibles" she said and although Talent intends to continue to produce QL titles for some time yet producing them in both disc and Microdrive format would be difficult.

It's not yet certain whether or not a buyer will be found for the rights to the QL in the longer term, or indeed whether Amstrad will be willing to sell the machine, but of the possible buyers it would seem that Thorn EMI a long-standing Sinclair component manufacturer, is currently the front runner.

Miracle's WS4000

New Miracle modem

MIRACLE TECHNOLOGY is set to launch an auto-dial, auto-answer, Hayes compatible modem for £176.40 including VAT. The new WS4000's standard version supports V21 and V23 standards and offers speeds of 300 600 1200 1200/75 and 75/1200 baud.

It can also be upgraded to include V22 1200 Baud full duplex and 2400 baud full duplex and has options of DTMF tone dialing battery-backed internal telephone directory process control port and approved Bell standards to be used for transatlantic communications purposes.

Details from Miracle Technology, St Peters Street Ipswich IP1 1XB (0473 216141)

Cheetah Amdrom now on sale

CHEETAH intends to start shipment of its £34.95 Amdrum digital drum machine for the Amstrad this week and expects them to appear in the shops by next week. Latin and Electro kits with kit editors should also be available for the Amdrum at that time.

Details from Cheetah Marketing 1 Willowbrook Science Park Crickhowell Road St Mellons Cardiff (0222 777337)

Commodore to clash with Atari

◄ Continued from page 1

liable to supplant it.

Atari is thought to be scheduling its new machine for a September launch and to differentiate it from the current top of the range 1040ST it is likely to have at least two megabytes of memory. The company is also likely to take advantage of the extra memory and the blitter to try to widen the ST's appeal into more specialised fields.

This is the route Commodore intends to take with its current Amiga in the UK. The company has recently appointed eight new dealers who specialise in graphic design rather than in computers, the idea being that these dealers will be able to sell the machine as part of a graphics solution rather than as a computer.

"The graphics industry is an ideal area for fully utilising the Amiga's abilities", said Commodore acting general manager Chris Kaday. "This represents the first of many vertical market areas into which we will be launching the Amiga."

Commodore's hit list of these areas consists of graphics business, desktop publishing education and music, and it hopes to develop a small but lucrative market in each of them. But the advent of a more powerful blitter-based Atari machine later in the year is likely to mean Commodore will need the support of the Amiga 2 to succeed.

In the United States Atari would seem to be winning the 68000 war. Initial reports after the launch of the Amiga and the ST were that the Amiga was holding its own, and possibly doing better, despite a higher price. Atari however now claims worldwide sales of 200,000 STs and predicts 500,000 by the end of the year. This is a tough target to achieve but the company now seems to have sorted out its US distribution and is managing to get the ST into the major chain stores.

Enterprise is beamed down

ENTERPRISE Computers has gone into receivership just shy of three years into its lifespan The company announced its micro first called the Elan and subsequently the Flan then the Enterprise due to legal problems on September 14 1983 but September 14 1984 had come and gone before the high specification micro finally came out of the traps The Z80-based machine had looked attractive when first announced but although its launch specification exceeded that of competing micros such as the Spectrum and the Oric it arrived too late to reap the benefit of the home micro boom and like the Memotech (recently dead buried and resurrected itself) it existed on low sales and a small but determined band of enthusiasts

A spokesman for receiver Grant Thornton wasn't able to comment on whether or not there would be an attempt to rescue the company but given the current financial climate in the micro industry the chances of this happening look bleak

Debts run into six figures

Enterprise: Boldly gone . . .

Domark's new signing is trivial

DOMARK which was recently forced to redesign its 'unauthorised' *Splitting Images* game appears to have learned the error if its ways and has bought the rights to produce the computer version of *Trivial Pursuits*. The company intends to launch the game for the Spectrum, 64, Amstrad and BBC at the PCW show in September and claims advance orders of over 40 000 units – enough to produce a hit game

It is intended that the game will feature many of the standard questions but will also have additional questions designed to take advantage of sound and graphics It will cost £14 95

Mark Strachan and Dominic Wheatley chach their new game for signs of life

Gold bows to telex pressure

TELECOM Gold is to drop its 50p charge for receipt of incoming telexes today (Thursday) The charge has been levied since the electronic mail service began its telex service two years ago and has caused a considerable number of complaints from subscribers particularly those who found that some of their telex traffic turned out to be junk mail

Phone trouble for Software Discounts

MAIL ORDER software discount house Software Discounts appears to have had its phone disconnected *Popular Computing Weekly* would welcome information from anyone knowing the company's new phone number and/or its current status

SiD meeting

THE CREDITOR S meeting for Software International Distribution which went into liquidation recently is to be held in London on 17 July

Any readers owed software from the company's discount software offer should write to *Popular Computing Weekly* giving their details as soon as possible

Robtek launches 50 game King Size

ROBTEK is to launch a new 'King Size' range of budget tapes which will consist of 50 games for £9 95 over a variety of formats The company hoped to launch the Commodore 64 version this week, with C16/Plus 4 MSX Atari Spectrum and Amstrad versions following through July

Budget utilities including a turbo loader for the C16/Plus 4 at £4 95, are also planned for release shortly

Details from Robtek Unit 4 Isleworth Business Complex, St Johns road Isleworth, Middx TW7 6NJ (01 847 4457)

Coming soon: a PC glut?

THE LAUNCH of Spectrum's IBM compatible machine manufactured by Bondwell (see last week's issue) seems to have triggered a price war between Spectrum and the machine's main UK distributor, Barbatan

On hearing of Spectrum's pricing Barbatan dropped the prices of its own Bondwell machines making Spectrum's 'Amstrad cruncher' look a lot less revolutionary The price level for the basic 640K machine is £890, which – excluding very small production run machines and 'one-offs' is a new low for the UK

Trade prices of £250 for IBM compatibles are however becoming more and more a reality here

This is unlikely to please Alan Sugar who has traditionally attacked soft markets with is products The PCW series for example is based on tried and tested Z80 technology using the CP/M operating system Small manufacturers had actually been doing this for some time with £250 £400 5¼ inch drive CP/M machines having been on the market for some time prior to the advent of the PCWs

But Amstrad scored with the marketing of the PCW It was available in quantity through easily accessible dealerships and sold into new markets as a word-processor/typewriter Because it was relatively hassle-free and was perceived as good value, it sold

Now Amstrad probably intends to do this with his PC In order to sell it must be perceived as being something that is exceptionally good value But there's the rub

With the PCW Amstrad didn't have any serious competition as most of the manufacturers of CP/M machines had already moved over to the IBM/MSDOS standard This time round they're still with IBM, and will be forced either to withdraw from the low-end PC market, as Apricot has, or cut prices

Even if it's simply a case of their having nowhere else to go at the moment many of them will think in terms of price cuts

If Sugar has a new angle to his PC that will make it difficult from the price-cutting opposition it will succeed But if not he has a fight on his hands

Product News

Compumart cuts prices for discs

MAIL ORDER company Compumart has cut the price of its blank discs Amsoft 3 inch discs are down from £40 a box of ten to £32 while 3½ inch discs £18 for single sided and £24 for double

The company s 5¼ inch discs are now £9 95 for a plastic box of ten, with two free discs being given free with every ten purchased All orders are subject to a £1 charge for postage and packing

Details from Compumart, Unit 8, Falcon Street Loughborough Leics LE11 1EH (0509 262259/233893)

A mice pair

ZAP ZONE and MIND GAMES are two new BBC packages designed to be used with the AMX Mouse *Zap Zone* comes on tape and is a mouse powered arcade game, while *Mind Games* is a collection of five intelligence testing games It costs £14 95 on disc while *Zap Zone* is £4 95

Details from Advanced Memory Systems, 166-170 Wilderspool Causeway, Warrington WA4 6QA (0925 413501/2/3)

C compiler for BBC 68000

DELCOMM S DMB 68000 second processor for the BBC micro and Master series is now available with a C compiler at no extra cost. The DMS 68000 currently comes with 128K Ram and can be expanded to 15 megabytes A 256K expansion board is currently under development

The current system includes the board, two Eproms containing linking software and a cross assembler user manual assembler manual and a guide to 68000 assembly language System software includes assembler, monitor and the C compiler the complete package costing £351 76

Details from Delcomm Microcomputer Systems 46 Nasmyth Road Southfield Industrial estate Glenrothes, Fife (0592 775022)

The last word on home WP

WORD PROCESSING is a user group and by-monthly magazine designed for users of home word processors. It currently concentrates on Amstrad machines, with some coverage of the BBC micro, but plans to expand to further micros and to other serious software eg databases and spreadsheets, in future issues

The group s aim is to produce easy to understand information for the new user It has also managed to secure discounts including £20 off NewWord, for members Membership (including the magazine) is £8 a year

Details from Word Processing PO Box 97, Wolverhampton West Midlands

Hantarex launches mono monitor

THE HANTAREX HX12 is a high resolution 12 inch monochrome monitor featuring 80 column display, 18Mhz band width and audio input. It costs £79 50 Details from Hantarex Unit 2, Lower Sydenham Trading Estate Kangley Bridge Road, London SE26 5BA (01 778 1414)

Diary Dates

JULY

16-18 July
PC User Show
Olympia London
Details Hardware and software for IBM machines and their compatibles
Organiser EMAP 01-608 1161

24 27 July
Acorn User Exhibition
Barbican Centre London
Details. Hardware software and peripherals for the Electron BBC micro and Master machines.
Trade only 10am-1pm on 24 July
Price: £3 adults, £2 children, £1 discount for advance sales.
Organiser: Editionscheme, 01-349 4667

SEPTEMBER

3-7 September
Personal Computer World Show
Olympia, London
Details: Software and hardware for home educational and business computer users For the first time this year the show is to be organised in three separate halls – business, games and education.
Price £2.
Organiser Montbuild, 01-487 5831

8th September
Official Commodore Computer Show
UMIST Manchester
Details: A wide range of Commodore hardware, software and peripherals. Formerly the Commodore Horizon show
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Publications, 061 456 8383.

26-28 September
Electron and BBC Micro User Show
UMIST Manchester
Details Software, hardware and peripherals for the Electron, BBC micro and Master machines. Produced by Acorn
Price £3 adults, £2 children, £1 discount for advance booking.
Organiser Database Publications 061-456 8383.

OCTOBER

3-5 October
The Amstrad Computer Show
Novotel, London
Details: Home and business software and hardware for the Amstrad range of computers.
Price: £3 adults, £2 children, £1 discount for advanced booking.
Organiser Database Publications, 061 456 8383

30-31 October
Hampshire Computer Fair
Guildhall, Southampton
Details. Business computers and communications.
Price Free entry by business registration.
Organiser Testwood Exhibitions, 0703 31557

NOVEMBER

22 November
The 6809 Christmas Show
Royal Horticultural Hall, Westminster London
Details: Dragon software and peripherals

Prices, dates and venues of shows can vary and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations in show arrangements made by the organiser


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Letters

Citizen patriot

I'm writing this letter as I was surprised that the Citizen 120D printer was not listed in the supplement (*Popular Computing Weekly June 19*).

I've had my Citizen for more than a month and I've continuously used it without fault with my QL. It is compatible with Epsons and an IBM Graphics printer through its Centronics or the optional RS232 interface. The interfaces are on cartridges which means that changing from a parallel to a serial printer takes only a few seconds and not a costly business in sending it back to the factory. It prints at the speed of 120 CPS in draft mode and 25 CPS in NLQ.

NLQ italic, emphasized, condensed and pica can be selected through the front panel by pressing a combination of the On Line, LF and FF buttons. A fully comprehensive manual comes with the printer which is a credit to Citizen.

It works well with *Quill* although I did have difficulty printing in NLQ at first. The problem was that *Quill* was programmed to send the code *Chr$(27) @* to initialise the printer to the present DIL switches before sending the letter. Therefore the only way to print in NLQ was to set the option in the DIL switches which was impractical.

The solution was to load the install bas program as described in the information section of the User Guide. You then select the option to edit the Epson code and delete the *Esc@* from the preamble code.

In my opinion the Citizen 120D is better than most of the printers listed in the supplement, better even than the Epson FX-80 and RX80, Seikosha 700A, 100 and 250X, Brother HR15 and HR-5 and perhaps even better than the Centronics GLP.

The Citizen 120D printer sells at the reasonable price of £180 from some shops which is much lower than its competitors.

Rhys Miles
Little Quarry
Heol Las
Energlyn
Caerphilly

Brain storm

I have recently purchased a second hand New Brain AD computer as manufactured by Grundy Business Systems who I believe ceased trading but I understand that the New Brain was rescued.

Would it be possible for you to send me a list of any back issues of Popular Computing Weekly which feature articles or listings for this computer together with the name and address of the company that rescued the New brain if they are still trading, also any additional information, names of publications etc that may be of help to me.

Also if any of your readers could help me with listings, software or secondhand hardware for this computer I would be most grateful.

A J R Yates
88 Lansdowne Crescent
Carlisle
CA3 9EP

I'm afraid we never covered the New Brain in much depth Mr Yates – perhaps one of our readers could help?



Scotty! ... Scotty?

File copy

In your issue dated November 21 1985 you published a comprehensive database called *Com Filing System* by Wail Sabbagh The final part of this program was in December 5 1985

After entering the complete listing I found the program useful and would recommend it to any small business user

However on return from holiday I discovered that my copy had gone missing I would therefore be obliged if you could advise me whether the program is available on tape and at what cost.

James C Hardie
Kilsyth
Glasgow

You are in the hands of the author If you'd care to write to him care of the magazine, we'll pass on your request

Bigger and better

The Character Expansion program for the Amstrad CPC machines *(vol 5 issue 21)* from Brian Cadge works very well My only regret is that it works on expansion only, and *not* on contraction

It is indeed interesting to use smaller characters in mode 1, preserving the four-colour screen We could also imagine the 80-column size in 16 colours in mode 0

I would appreciate it if someone could suggest the modifications needed to make these improvements

Jose L van der Zypen
Brussels
Belgium

Ancient games

Recently a friend of mine arrived back from Nigeria and brought a board game called Ayo

Having played the game several times I was fascinated with its complexity A visit to the library revealed that the game is a version of Mancala, one of the oldest board games known

Can anyone tell me whether the game has been computerised, and where it is available?

B Clegg
Oldham
Lancs

Einstein theory

I have been an Einstein owner for two years and am surprised at the lack of support from the computing press

It must be the most versatile home micro available

Since joining the UK Einstein Users Group the amount of information I get is wonderful

For any Einstein owners out there who still feel cut off can I suggest that they contact Jean Skillern, subscription secretary, UKEUG, 36 Nelson Row Ford, Nr Arundel, Sussex

Chris Giles
Portslade
Sussex

Which Amstrad

Whenever we are given a program in *Popular* the name of the computer is given at the top of the page Spectrum and QL programs are not presented as "Sinclair", nor C64 items as "Commodore".

So why can't we be told more than just the fact that a program is written for the Amstrad

Anyone considering buying a word processing system might be persuaded to get a PCW8256 in the belief that they could also type in programs from magazine listings

Alan Baker
Portsmouth

Right you are Mr Baker, which is why we started putting 8256 at the top of programs for that machine some weeks ago – see *Better Basic, Vol 5 issue 18*, for example

Shock review

I simply had to write and tell you about a strange experience I had the other day I read a John Minson Review that I agreed with! The shock of this was no small trauma I can tell you! You must realise the importance of this unique discovery, the first of its kind

I refer to that wonderful offspring of St Brides *The Snow Queen* I enjoyed John's review immensely almost as much as the game

I have considered *Quill* to be a competent atmosphericide, but in the hands of St Brides it creates pathos, humour sympathy and overwhelming atmosphere in enormous dollops

One incongruity is that in the light of their previous anarchic outpourings it is not unlike watching Brian Rix play Hamlet One expects farce and instead we are treated to a wonderful story beautifully portrayed

I must be mellowing in my old age as I not only enjoyed John Minson's style but I only found one bone to pick with him my CBM64 has a RAM-SAVE facility (What it doesn't have is a TEXT-only mode)

After 150 adventures I have begun to tire of the 'dubious morality' of most adventure scenarios It is so nice to find one that requires one to do the 'right thing' The image of the little girl setting off down the hill alone was a real tear jerker!

Hugh T Walker
7 Burnet Avenue
Burpham
Guildford
GU1 1YD

Going public

I have been into computing for quite some years and have a variety of machines (Spectrum Amstrad)

During that time I have written quite a few routines of various sizes and was wondering what to do to get them published in *Popular Computing Weekly*?

Richard Leadbetter
Cecil Park
London N8

We are always looking for new listing ideas What you must do is send us a working copy of the program together with some documentation you'd anticipate being published with it, marking the whole for for the attention of technical editor Duncan Evans

We pay £25 per page – or £5 for something appearing in Bytes & Pieces

Puzzle

Puzzle No 218

In the following cross-number puzzle numerical values and not words have to be fitted into the grid

1			
2			3
4			

1. A^2
2. B^2
4 A * B

1 B
3 A

Can you find the correct values for A and B?

Solution to Puzzle 210

He has 126 blocks which fit into a 5 × 5 × 5 cube with one left over These same blocks could be arranged to form a right-angled triangle with sides of 28, 45 and 53 units

To solve this problem we need to find a right angled triangle with integral sides and hypotenuse in which the sum of these values is just one more than a perfect cube Lines 10 to 60 do this the two sides being taken and the length of the hypotenuse is calculated using Pythagoras theorem If this is an integral value the program calls the subroutine which checks to see if the sum of the three sides is one greater than a cube Because of the inaccuracies in the calculation of cube roots directly the program uses a circuitous method of multiplication to check if the value is an exact cube (lines 100 to 140)

As soon as a value is found the program stops.

Winner of Puzzle No 210

The winner this week is D Tilley of Cottingham Humberside £10 is on it's way

Rules

The closing date for puzzle No 215 is July 29

Spectacular Spectre communications

John Lettice takes a hard look at the latest Spectrum hardware

It's an ill wind that blows nobody good and the conspicuous lack of QL owners beating a path to Tandata's door to buy the QMod V23 modem has created an entrepreneurial opportunity for Spectre Communications. Take one QMod, attach a Rom-based Spectre Comms pack for the Spectrum and you've got a neat setup that will operate at 1200/1200/75 and 300/300 (sort of) for under £100. Spectrum owners are of course liable to be a bit perplexed when they unpack the kit and find the packaging's got "QL" written all over it, but no matter.

The comms package is available separately, but is designed to match the QMod, the complete kit consisting of two black boxes that stack together at the rear of the machine. Plug in the comms pack, fit the QMod onto the expansion bus on top of it, switch on and you're ready to roll.

The Rom software cuts in immediately on power up and presents you with an options menu allowing you to log on or off, go into viewdata terminal mode, save, view or print frames (on a ZX Printer), download software, edit messages and frames or go into scrolling bulletin board mode.

The main options menu will either execute the function directly, or will move into a sub-menu presenting other options, log on/off, for example, being split into auto log on, manual log on and log off. If you choose either of the first two you part company with the user friendly menu system at this point, as the procedures are the same, and you're simply presented with the query 'Identity?'. Reference to the manual, however, reveals that auto log on is for use with Prestel systems, where identity and password can be entered prior to logging on. This stores the identity and password string in memory, while manual log on is the same, except that it doesn't.

This is one instance where the menus, although nearly user-friendly enough for you to be able to do without a manual, fall down. There's also a problem here with the comms pack itself, which has two switches, a line switch and a mode switch, but as neither is labelled, and the manual fails to tell you which is which, it's possible some users will be confused.

Even new users should be able to work it out with a bit of thought, but a couple of sticky labels wouldn't go amiss here, and a couple of extra lines in the software indicating which switch is which would also be helpful. For the record, the line switch is the one on the right, while the left hand one, the mode switch, takes you between 1200/1200 and 1200/75. The latter is accessed by pushing the mode switch in and the former by out. Actually getting onto a system is easy, though again it could be a little more obvious. The Spectre doesn't support auto-dial, so with the line switch out you phone the system then push it in when you get a carrier. You're then effectively into the system.

The Spectre seemed to log onto Prestel easily enough, and although I initially had trouble with Telecom Gold at 1200/75 and 1200/1200 this seemed to be related to the speed with which the software reacted to a carrier (Gold drops you very quickly if it thinks you're wasting its time) and – possibly – to line noise, the local phone system not being all it might be.

Storage and printing of frames are among the bells and whistles. Frames can be stored on tape or Microdrive, or can be placed in memory, while although printing is normally on a ZX Printer the manual does tell you which line to modify if you want to use a different printer. In addition to this there's a downloading menu, and offline editing for messages. Bulletin board access is catered for at 1200/75 and 1200/1200, but 300/300 can be produced by a simply wiring job on a cable to Spectre's built-in RS232 port (Sinclair Interface 1 standard) and by using an external V21 or V23 modem. The scrolling terminal menu controls bulletin board protocols, and can be used to alter word length, parity, stop bits, echo and line feed.

From the Spectrum owner's point of view I'd say the Spectre package is decidedly A Good Thing. It's got a certain amount of flexibility to it in that you aren't tied to owning a dedicated Prestel machine, yet it's simple enough to use for it to be attractive to people new to communications. It would have been nice to have 300/300 built in, and nice to have just a shade more nursemaiding from the software, but overall I'd say it was a good buy.

John Lettice

Product *Spectre Communications pack* **Micro** Spectrum 48/128K **Price** £94 **Supplier** Spectre Communications, The Old School House, Tenter Row, Crosby Ravensworth, Penrith, Cumbria CA10 3JA (0931 5362)



Do-it-yourself games

It's a while since we've seen one of these on the Spectrum, the games writing package to let the non-programmer write his or her own masterpiece of arcade action. Sure there are packages like *Laser Basic* which make it easier to emulate Denton Designs, but this is aimed at the complete klutz end of the market.

With two tapes and an instruction manual, it's a well packed package. First up is a graphics designing kit which works well. You can create and animate smallish sprites and a similar grid lets you design UDGs for the scenery in front of which life or death battles will be fought. With mirror, rotate and inverse instructions plus on screen prompts for filing and testing, even I found these easy to use.

Rather less satisfactory is the sound facility. Not that it's complex but it's rather a matter of trial and error to arrive at that satisfyingly rude rasp you've always been listening for. There's also the opportunity to design the screens and you're given a warning if they begin to eat up too much memory. Clearly careful planning will be necessary if you're to make the best of this facility, and don't expect to come up with a landscape as attractive as *Fairlight's*!

The sprite designer allows you to create your game characters for later animation.

The demo game, Apple Picking, shows you what is – and isn't – possible

Save your beta once you've completed the Leonardo stage – and how good to see a verify facility – then turn over the tape and what's this? A demo game lurks on side two and as you play a horrible realisation dawns. Once you've created all those unique UDGs and sparkling sprites, there's damn all you can do with them!

The instructions fail to make it clear that before you create the game with tape two side one, you need to initialise a blank tape from tape two side two – one of the two serious omissions that I noticed. You then specify which sprites will be used where, how points will be scored and the nature of time bonuses, and the directions of the nasties that you'll be unleashing on the unwitting player.

But the big decision is what type of game you're creating. Ultimate style 3D? Mel Croucher conceptual? Elite epic? Think again. The choice is pure and simply shoot 'em up vs platforms and ladders. Or to put it another way, *Invaders* with frills or *Manic Miner* without Willy, the games you grumble about even if they only cost £1.99!

You can mix the two types within any one game but then another horrible realisation dawns. There is no facility for automatically moving to the next screen once you've completed one. It's all done by pressing 'E' (the other thing the instructions neglect to mention).

This does make serious game writing near impossible.

In the long run you'll need to ask yourself why you want such a package. If it's merely for a bit of fun and the creation isn't the thing, then *Arcade Creator* is simple to use and does what it aims to do. But if you want to write games that anyone would want to play, this is just not enough. You'd do better spending some time actually learning to program your Spectrum.

John Minson

Program *Arcade Creator* **Micro** Spectrum 48K **Price** £14.95 **Supplier** Argus Software Group, Liberty House, 222 Regent Street, London W1R 7D6

Kissed by DeBug

Kissed from Microdeal is not, as the title would suggest, the latest in tacky games, but a very comprehensive machine code debugger.

What's on offer then is full screen editing, five multiple pass breakpoints, tracing and execution options, a disassembler and mini assembler, memory block manipulation commands, completely isolated screens from target, relocation of program, keyboard escape and a dump to printer option.

Kissed itself occupies only 12.5K, however the memory used can be as much as 45.25K depending on the size of the isolated window required. Also, the program can be used with either mono or colour monitors/TV's as there are separate versions supplied on the disc.

The accompanying manual starts well enough but rapidly acquires the clarity normally reserved for printer documentation. An inexperienced programmer will find the latter sections all but impenetrable, but then is, what Microdeal calls, the ultimate debugger aimed at anyone but the experienced machine code user?

The main functions of the program are the memory and register dumps, all of which can be altered easily, and the disassembler. An interesting extra feature is the ability to 'patch' single lines of assembler onto the disassembler to cover bugs or things forgotten. Inserting code larger than the space you wish to enter it in will result in the code next to it being overwritten, so care must be taken when doing this.

Blocks of memory may be moved, filled with specified characters, verified or have search and replace actions carried out on them. This feature can be quite useful, if not immediately so.

Using the execution options the target program can be run, with checking on various system pointers. However, care needs to be taken to avoid crashing the system on return to TOS.

If this is the sort of package you've been after, look, despite the dire manual, no further.

Duncan Evans

Program *Kissed* **Micro** Atari ST **Price** £29.95 **Supplier** Microdeal, Box 68, St Austell, Cornwall PL25 4YB


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Bouncy Reflective (Reflex) Action

Spherical objects They're getting everywhere nowadays and it's time decent minded people put a stop to it I say What started with *Marble Madness* and *Bounder* has continued with *Bobby Bearing* – and now *Action Reflex* Where will it end? Well, in this case the list ends with an altogether above average arcade game

With a name like *Action Reflex* you'd expect to be ducking and diving dboging and weaving amongst the alien hordes blasting away like there was no tomorrow Not so as this one requires quickness of thought in addition to some pretty nifty joystick skills

The general dea is to guide your bouncing ball (an escapee from an Amiga demo I would guess) through screens against time – but whereas *Bounder* had you bounce onto objects in *Action Reflex* you must bounce over them, contact with some meaning instant oeath (you get resurrected but lose valuable time) others simply get in the way

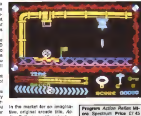
All this is done against time in simple, but effective 2-D graphics – the doject being to complete the maze of screens within a certain period and to collect bonus points which will help you on your way

Controls are easy – left/right and fire to control the height of bounce

A few minutes play shows the thought that has obviously gone into the design To overcome some obstacles you must bounce from another screen while others require careful positioning

This is a game more of strategy than of reflex but if you're in the market for an imaginative, original arcade title, *Action Reflex* is in with a shout

Despite the hackneyed subject matter, you might still have a ball **John Cook**



Program *Action Reflex* **Micro** Spectrum **Price** £7 45 **Supplier** Mirrorsoft, Purnell Book Centre Paulton, Bristol BS18 5LQ

Fun For Every Knight

As game titles go something like *Summer Games* or *Winter Games* is reasonably self-explanatory But *Knight Games*? All becomes clearer and thoroughly more logical when you realise that what we have here is a game involving things medieval

Think of across between *Exploding Fist* and *Summer Games* (Fifteenth Century style) and you won't be going far wrong

Knight Games is a multi-loader consisting of six combat games (Swordfight 1 and 2, Quarterstaff Ball & Chain, Pike Staff and Axeman) and two hit the moving target games (Crossbow and Archery) Before that word 'multi-load' has you running for the Valium you'll be pleased to know that the average waiting time is about two minutes

The major hallmarks of all the events however are the superb graphics and sound These are some of the most brash an colourful screens you have ever seen on a 64 with some excellent original sound effects and music (with suitable heraldic overtones) No complaints in this department, squire – but how do the events play in themselves?

There's no denying that despite the differences in weapons, many of the combat events play in very similar fashions Controls are the same for each – with defensive moves on the joystick diagonals and attack using the verticals/horizontals – a total of eight not including movement left and right

With the exception of Quarterstaff – despite the animation being changed each event – the overall feel is not radically different Despite this there's no denying that there is still a great deal of enjoyment to be had – particularly in two player mode

Hack, clang, hack – not much subtlety here maybe – but it's great fun nevertheless and it's certainly fast and furious

The target events are a simple hand eye co-ordination, with the added spice of an unsteady cursor (with which you aim your shot) and the fact that you're competing against time

Knight Games may not the most challenging of combat/sports type programs What it is, is a game that will charm you with its colour and atmosphere Combine this with a playability which will entertain without stretching any mental ability and you have a hit that will particularly appeal to the younger player

John Cook

Program *Knight Games* **Micro** Amstrad **Price** £8.95 (tape) £14.95 (disc) CBM £8 95 (tape) £12 95 (disc) **Supplier** English Software 1 North Parade Parsonage Gardens Manchester, M60 1BX.

Masterful

If Mastertronic keeps this up, the other budget labels might as well quit now *Speed King* the latest, is a winner all the way with fine graphics and sound effects, and non-stop action

Yes, I know there've been racing simulations before but this one is so well done it deserves a place in the cassette player of every C64 and 128 owners

At two quid it's an offer you can hardly refuse and the exe-

cution is so good I d pick it over *Revs*, *Pole Position* et al

Speed King is a motorbike simulator and the animation is great. As you take the corners your rider leans into the bend dropping his head to watch the road Open the throttle as you come through and he slides back into position

You'll find yourself leaning in your chair through the esses

There s a host of options too Ten circuits including Brands Hatch and Silverstone three skills levels, practice laps, and races against 19 kamikaze opponents who give no quarter on the track You can vary the number of laps per race too

One nice feature is that the game records lap and race times for every combination of track and race-length so you can play against friends or challenge for your own personal records

Speed King is little short of brilliant.

Peter Worlock

Program *Speed King* **Micro** Commodore 64/128 **Price** £1 99 **Supplier** Mastertronic, 8-10 paul Street, London W1R 7DB

Blackstar Classic

You can t keep a good man down is a rather old saying Well in this case it should be You can t keep a good game down ' and it aptly applies to *Blackstar* Originally released by SCR for the Spectrum, this adventure has seen more labels than a can of beans However in saying that, *Blackstar* or *Castle Blackstar* as it was first known, still ranks as one of my old time favourites

The objects of the game is to find a mystical Orb and return it to the Fair Lady Artemis Your explorations begin above ground and gradually move into the Castle where all sorts of devious problems gloomy locations and astounding events await you before tackling the locations below the Castle

The descriptions in this text-only adventure are long and satisfying, building up a world where anything is likely to happen and invaribly does, but the programmers have had the good sense to include a Ramsave and my advice is to use it regularly (programmers please note)

Before this particular quest is over you will have encountered such notable characters as The Hydra who is rather spartial to ginger-bread a wicked witch – anybody fancy a flying broomstick , and the proverbial Dwarves (well I mean what adventure is complete without a Dwarf or two)

R Garrett

Program *Blackstar* **Micro** Amstrad CPC128/PCW8256 **Price** £7 99 **Supplier** CRL Group Ltd, CRL House, 9 Kings Yard, Carpenter s Road, London E15

Floyd the Funny Droid

I must admit that opinion is divided, but I for one would defend *Floyd the Droid* just on the grounds of its title even were it not an original and visually engaging romp

This Dutch import features a sewer-cleaning robot – none of the glamour of interstellar warfare here Your task is to pre-program the droid to deal with the rats bats lizards and assorted nasties lurking in the sewers, then guide him around the network cleaning it out

As you cruise the sewers the cleverly animated droid shouts BOO! at your command to flush out the vermin (good speech synthesis here) Having smelled a rat, your viewpoint switches from the usual 45 degree perspective to a side-on view You must now choose the appropriate sequence of actions – jumping shooting running forward and so on – to exterminate the vermin You can either do all this with the joystick, or pre-program a sequence in the Procedures screen It s not possible to pre-program a procedure to deal with the rogue droids which sometimes attack you you have to fight them manually

The aim of the game is to clean out the sewer system as quickly as possible while sustaining as little damage as possible and covering the ground efficiently

Floyd the Droid has lots of good points, not least nice graphics, light-hearted sonics and very original game play The office sceptics would point out, though that it a frustratingly slow to play – a major drawback to what could otherwise have been an excellent title

Chris Jenkins

Program *Floyd the Droid* **Micro** CBM 64 **Price** £9 95 **Supplier** Ariolasoft, 68 Long Acre Covent Garden London WC2.

About as fun as Earwig Racing

Picture this.

Scott: Mah bonny wee engines captain – they can t take it (Cut to Scott pieces of plyboard and polystyrene falling aroundhim Screen shudders)

Engines: Whheeeinggg blurp (Silence Extras pick themselves up off floor nursing bruises)

Scott: It's no good captain she s lost all power

The theory, I suppose is fine If the BBC can whang out interminable repeats of outmoded space operas and still having people in their thousands eating them off a stick, it should also be possible to make a killing by chucking out Basic programs with laughable graphics dodgy routines and a space hook Hello Bug-Byte, hello *Star Force Seven*

I m a sucker for management games and bearing in mind the fact that many of the all time greats are humourous on a par with *Star Force Seven* I braved the howls of derision from the rest of the office and gave the game every chance It s basically (Basic-ally?) text with a couple of unimpressive graphics thrown in and the script goes something like 'Take this battle fleet and cruise around the galaxy beating hell out of the Thuggoid empire

To do this you orbit a planet, bombard it (gronk gronk, said the guns), then assault it from the air, then on the ground Once you ve done this you replenish your forces, then it's off to the next exciting planetary attack As an intellectual challenge it s just north of earwig racing There s another bit that covers space combat but that's boring too No No No

John Lettice

Program *Star Force Seven* **Micro** BBC B/Electron **Price** £1 99 **Supplier** Bug Byte Liberty (Huhl) House 222 Regent Street, London W1R 7DB



The Trilogy completed

Tony Kendle with the last Knight Tyme story

Well deserved acclaim is being received by the new David Jones budget masterpiece *Knight Tyme* which has appeared first for the 128K Spectrum. For those who really don't know, *Knight Tyme* is the third in a Mastertronic series that began with *Finders Keepers* and *Spellbound*.

Each of the games were extraordinary value when released (very cheap yet of comparable quality to full price games) but they have all been eclipsed by the latest which is being made available for the current range of 128K machines, using the extra memory at the amazing price of £2.00. The graphics are of excellent quality, the popular Windowmation menu system has been retained but there are more rooms and more devious puzzles. A slimmed down version of the game will be out for most 48-64K computers as well.

In his last letter to the column David promised us some tips on *Knight Tyme* after the game had hit the shops but before we get on with them, David has the good news that the game should be available for the Amstrad CPC range and MSX by the time you read this – also *Spellbound* is being converted for MSX and Atari.

He also writes "since reading the comments of Eric Ellis about the similarity between the *Spellbound* puzzles and Agatha Christie books I have taken to reading them rather than my usual literary diet of SF and more SF. Agatha Christie has given me a few interesting ideas for future games." Eric Ellis, what have you done? Future games players of the world may curse you for putting new ideas into an already fiendish head. Anyway let's get on.

"I have not overdone the clues because the game is so new – but I will send more later if anyone needs more help.

Before you can use the Transporter you must mend it, you must also have some valid Transporter Coordinates to enter into it and be standing on the Transporter Pad.

To fix the Transporter you move the Starship to Starbase 1 (via Polaris) and Communicate to Request Overhaul Starship. The Transporter will be fixed by the Overhaul Crew. In the 48K version request Gordon to help and he will reroute the control circuits under the guidance of the Overhaul Transporter on Starbase 1.

"If you then request help using the Communicate command when at Starbase 1 you will see some Transporter Coordinates to use. Note that you can't beam down to every planet you come across and that you can only beam down to the one you are orbiting at the time due to the distance limitations of the Transporter Beam. Also, the Advert is useful in the game.

David continues, "Take care not to run out of fuel. Certain planetary locations will supply you with a full tank, others may still be waiting for their fuel delivery and others may just not want you to help them anyway.

"For working out your planetary destinations you will need to construct a map of the game. The following start will apply to the 128K version only. The planets are laid out on an 8 × 8 grid. Not all of the 64 locations have planets in them and you can only move to stars that are 'next door' to the one that you are at.

To start the mapping here are the positions of some of the stars that you start near. It is useful to move to Starbase 1 fairly early in the game. Some other useful destinations include Reef, Herschell, Bingo, Plinkit, Monopole and Outpost.

Deneb	Gath	Lengraad
Limbo	Eden	Empty
Brightstar	Polaris	Starbase 1
Hestia	Empty	Empty

"Deneb is the star in the top left hand corner of the entire map."

That's all of the tips but there is one more important thing. Regular readers will remember the challenge set for hackers of *Finders Keepers*. David had a special cheat routine that could be set into operation using a secret poke. Well a similar system has been implemented on *Knight Tyme* that will give you access to any room or any planet. This routine can be accessed by poking a single byte somewhere in the game but we're not going to tell you what it is as it is going to form the basis of a competition for hackers.

The first three people who send in the correct poke, which is the same in both the 48 and 128K version, will win a special Magic Knight T-Shirt which David has had printed, so if you think you have cracked it remember to say in the letter whether you are small, medium or large.

A change of subject now to look at another excellent follow up. Alien Highway from Vortex. Andy Woods of Andover writes to say that he has completed it without pokes.

In case there are any non-believers you push the Terratron through four pillars and it goes under computer control. Then it moves forward to a little square and the Vortron and Terratron join up to form a sort of wheelless tank. This moves forward to a large complex and fires a couple of rounds – the screen goes white, makes a noise and you are left looking at the base upon which the complex stood. Then comes a completion message and a warning that next time it will be harder (big wow!!)

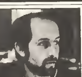
Andy has some tips for the game – but first, for some strange reason he insists on publicly declaring his everlasting passion for a certain young lady.

To save them both considerable personal embarrassment and due to the fact that most likely this would be an episode that both parties would regret in years to come Tracey Sutherley will have to remain anonymous. Sorry about that Andy.

Anyway, it is best to move up the left hand side of the highway. Leave the Terratron near the start, solve about 10 screens of puzzles and kill all aliens, then return for it. Before entering a screen always fire a few shots.

If behind the Terratron you can turn 45 degrees outwards and fire so no kamikaze aliens will get you. To get through the two calor-gas symbol-type pillars line up the vertical line on the vortex with the line that runs through the pillars – and that's it!

Indeed it is.



Graphic Amstrad Adventures

Tony Kendle creates with the Quill

Amstrad adventure-writers have had the benefit of Incentive's *Graphic Adventure Creator* for some while now and one or two programs are beginning to filter through from this source. They are of varying quality, as regular readers will now know, but I'm sure that what is, at the moment, a trickle will eventually become a *Quill*-like torrent.

Incentive's new series, *Medallion Adventures* will feature GAC'd programs, and they would be very interested in seeing *your* creation with a view to publishing it (and Incentive's marketing power means that your adventure is going to be seen by a lot of people). In the Spectrum field Gilsoft's *Quill* has held a monopoly for adventure-writing utilities, a monopoly that is challenged by Incentive. The Spectrum version of *GAC* is now released, and I am sure that it will prove a viable alternative to *The Quill*.

The new version is much the same as the Amstrad program, with the addition of, in the graphic mode, screen co-ordinates to help you find your way around. I haven't got room here to go into great detail about the utility, and you can refer back to Popular, Volume 4, No 51 (the Christmas '85 issue) for a close look at *GAC*. All the comments I made then hold true for the Spectrum release. Suffice to say that you'll probably find the utility easier, friendlier to use than *The Quill*, though possibly rather more limiting in terms of layout and so on.

The graphics-creating section of the program is capable of great results and with a certain amount of fore thought, some stunning games are possible. However as we've found with *The Quill*, the utility must be used with care in order to avoid that conveyor belt, mass-produced look: the vast majority of *Quill*'d adventures show a sad lack of imagination. After all, these utilities make it an easy task to write any adventure, but not necessarily a *good* one.

Since the first appearance of the basic *Quill* two extensions of the program have been released – *The Illustrator*, adding the facility for graphic illustrations to the plain text and *The Patch* which added certain much-needed embellishments, such as sound-effects and RAMsave. Phil Wade is the author of *The Patch* and writes to say:

'Many of *The Patch*'s features were inspired by comments in your articles; certainly the RAMsave facility was a direct result of your comment that very few adventures seemed to offer this facility. I'm not a professional programmer, and I'm not a whizz-kid either, having reached the incredible age of 38 (so young, so young!). I must be one of the minority of readers who can understand what *Bearle Quest* (Patch'd) is all about!

'I've just finished *The Expander* which is for text-only Quill'd adventures. It allows the writer to use the 7K+ bytes otherwise 'wasted', which represents a 25% increase in space. The utility will not go on sale though until I've finished two other programs to go with it, one of which is the opposite of *The Expander* (geddit?) and will be used with Patch'd programs.' *The Patch* has probably been responsible for a renewal of interest in *The Quill* and any update in the utility must be a good thing. More news as it arrives.

"The Quill requires plenty of imagination"

Gerald Kellet has also authored an add on to *The Quill* (the C series) which adds five extra actions to the utility: '*PARSE* extends input interpretation, up to 15 words at a time from a single line of input, *WAIT* effects a passage of time by cycling through the Status table and Turn flags update, *ADD* and *SUB* work on two flags instead of a flag and a fixed value, and *PERFORM* calls entries in the Event table as if they had been input by the player – this is primarily for 'forced syndromes / Event equivalents' and also for loops, shared routines, ORed and XORed logic. I am at present endeavouring to get this published.' If you want to know more about this interesting looking add on, contact Gerald at 28 Queen's Street, Stamford, Lincs PE9 1QS.

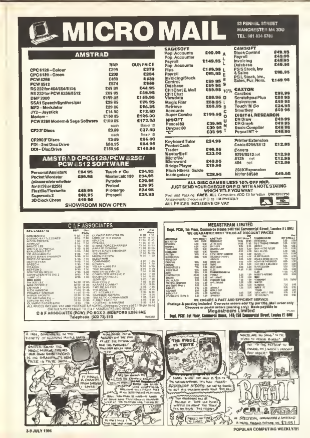
But, as regular readers of The Corner will be aware, there are several other adventure-writing utilities available for the Spectrum apart from *The Quill*, most of which have been seen in this Corner; joining these now is *The Spectrum Adventure Builder System* from Tartan Software. Tom Frost is the author of this utility, and his name should be familiar as the Adventurer of 1985, a title bestowed upon him by Incentive Software for being the first to solve the Ket Trilogy. As the creator of a couple of adventures, Tom has decided to pass along his expertise to us lazier mortals in the form of this adventure-writing utility. Where *The Quill* hands everything to the user, requiring only (!) plenty of imagination and lots of pre-planning, Tom's SABS demands some programming expertise of the writer. Not a lot, but as a reward the program is very flexible (and stunning value, I might add).

Essentially, some Basic in the form of short loaders must be written, but all the hard work of Data statements and variables is taken care of by SABS. On-screen prompts ask for the number of verbs and the maximum length, how many objects and the maximum length of their names, number locations, number of objects carried and so on and so on. The standard responses such as 'Here you can see' and other system messages can be changed at will, as can the screen layout and colours.

The Code Generator program then assembles all the data, another module passes the finished dataset to the machine-code which will run the adventure. This is what makes the utility very interesting – as you can see from the game that Tom has written using SABS, responses are as quick as with Quill'd adventures. *Spy Trilogy* is a three-parter displaying all the features available to users of SABS such as RAMsave, split screen scrolling and so on. The Trilogy is worth looking at on its own merits, with the first two parts being a beginner's introduction to the final more difficult part.

Graphics play a part in this game, and Tartan Software offer a *Graphics Aid* module, which will allow the user to build up a re-designed character set to use in pictures. This together with the main utility is all the adventure-writer needs to write professional-looking programs which should stand up to Quill'd games. And the suite of programs is great value at £4.50 for the main SABS module, £2.95 for the graphics module (you'll only be able to use it with SABS) and these are available together at £6.50.

Spy Trilogy, which I'd recommend as an excellent example of the utility's power and as a great adventure, is just £2.50: these prices represent fantastic value. All available mail order from Tartan Software, 61 Ballie Norrie Crescent, Montrose, Angus, Scotland DD10 9DT or from the software catalogue of The Adventurer's Club Ltd.


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Future programming for your micro

John Mawhood explains micro-Prolog

So often you hear people say that they bought their micro only to find that, when it comes to programming, the languages available for their machine do not really offer any useful scope. This may be because the language is difficult to produce good programs in quickly or because the version of the language they have is limited.

Anyone who owns one of the range of micros which run CP/M 2.2 or CP/M Plus software really can begin to use professional quality languages from the word go. At the moment a lot of this is only available at a hefty price – sometimes costing as much as the computer itself. But not all! micro-Prolog, although not exactly cheap, compares well with the price of packages for Pascal or C.

If you own a Spectrum or BBC machine you can get, for even less, 'native' versions of micro-Prolog which can produce graphics as well as having most of the features of standard microProlog.

Prolog was developed on mainframes and is the language the Japanese have adopted for their 'fifth generation' computer project aimed at the development of artificial intelligence and other wonders. Micro-Prolog is the version of the language for micros.

Every computer 'buff' has their favourite language. Generally you will find it's a question of horses for courses – to get stunning graphics you would not usually choose BASIC (Before hardened BASIC games authors write in, I am not saying you *cannot* do it!) But surely if Prolog is being used to develop so-called artificial intelligence it must be a pretty powerful language? Perhaps a language you could benefit from trying out?

A word of warning: once you have used micro-Prolog you may never be able to go back to your old language. If you have only used BASIC or PASCAL, at first you will find micro-Prolog a bit strange. This is because it is a *declarative* language not *iterative*.

I do not have space here to explain the reasons but it is generally accepted that 'structured' languages which can be programmed top-down are most useful, and produce better programs (and programmers). Structured languages help to prevent 'spaghetti' programs – where you cannot see how it all works. Another limitation with languages is the way in which information (called 'data') is stored.

Micro-Prolog gives the programmer perhaps the most structured language one could hope to have on a micro today as well as the most flexibility with data because data and programs are all the same thing in micro-Prolog. More than this it offers metalogical programming features available with few other languages. Metalogical programming involves writing programs that manipulate other programs or even themselves.

The power of micro-Prolog lies in the logical way it works – Prolog stands for PROgramming in LOGic. It is possible to create programs *at the keyboard*. You can start by writing a description of the whole problem you want to solve and then write the descriptions of all the stages which make up the problem working from the top down (true top-down programming). With other languages you have to do all that on paper first and then actually write the program from the bottom up. But in micro-Prolog it is possible to run a half-written program. When it comes to a part that is not written you have, if you use the trace facility that comes with micro-Prolog, the option of writing it *and carrying on where it stopped* – PASCAL or BASIC would treat that as an error.

```
((apply__user__defined__operation__
first__list__secohd__list__result__list)
   (empyt__list__first__list)
   (empyt__list__second__list)
((apply__user__defined__operation__
first__list__second__list__result__list)
   (split__first__list__head__of__first__
   rest__of__first)
   (split__first__list__head__of__first__
   rest__of__second)
   (split__first__list__      head__of__
   first__rest__of__second__result)
   (put__on__end__result__result__
   list__new__result__list)
   (apply__user__defined__opera-
   tion__rest__of__first__rest__of__
   second__new__result__list))
```

The micro-Prolog in the box is the only program you would ever need to apply any *two-argument operation* to two lists. Which could be lists of numbers or other constants (and that includes operations you have defined yourself, not just mathematical or boolean ones). This is possible because of the metalogical feature. In BASIC or PASCAL you could copy the routine each time and put in the operator you wanted, but it could not be used with a user-defined operation.

A micro-Prolog program is a list of words enclosed in brackets. The structure of each "list" is as shown below, with square brackets indicting optional parts and underlining indicating parts you cannot leave out.

> (*(program name first parameter* [any number of following parameters]) [any number of calls to sub-programs by name followed by the appropriate number of parameters – each call enclosed in brackets])

How does micro-Prolog execute these programs? Think of the program as describing the layout of a cluster of 'rooms' in an adventure game. Remember that each cluster of rooms can have corridors (i.e. make a call to) other clusters. Micro-Prolog is the adventurer and the goal is to reach the end of the 'list'.

The 'parameters' which you give micro-Prolog when you start it are like keys or tokens which it uses to pass through the rooms. It can find more keys of tokens as it works its way along. With the right keys, micro-Prolog will eventually work its way through all the rooms in the cluster reach the goal.

Some rooms contain tasks for micro-Prolog to perform before it can pass on to the next room. Some may e a corridor to another cluster. Micro-Prolog has to go down any corridor it comes to and work through the rooms at the end because

there may be tokens in them it needs to achieve its goal Once all the rooms at the end of a corridor have been 'done' micro-Prolog goes back and carries on in the main program

If micro-Prolog fails to perform a task in any room it has to backtrack to see if there were any alternative tokens it could have picked up earlier This can happen if you have written two or more versions of the same sub-program. Micro-Prolog has to try them one at a time until it finds the right tokens to enable it to perform the task it had failed on

Ultimately if a task cannot be performed after micro-Prolog has tried all the alternative sub-programs then it gives up altogether It shows its frustration (and tells you it has failed) by printing "?" on the screen

You may think that this is a far cry from BASIC where the computer executes one numbered line of instructions followed by the next unless your program tells it to do something else What it means is that micro-Prolog does all the work jumping about between the various parts of your program Nowhere in micro-Prolog can you GoTO another part of the program – as if it broke through the wall of a room – that would be cheating The advantage is that anyone else can work out what the program does – because all the execution follows the logic of micro-Prolog It is impossible to write "spaghetti" programs in micro-Prolog As a result you concentrate on solving the problem It is not surprising to find that commercial software written using Prolog can be half as long and written in a fraction of the time that it would take a conventional language

So how does our example program work? Let us say we have two lists (1 2) and (3 4), and we want to add the pairs of numbers together to make a third result list. (Remember micro-Prolog stores data as lists just as it does programs) So in our example "__user__defined__operation" will be a + sign and "__first__list" will be (1 2) and "__second__list" (3 4)

Micro-Prolog will start with the first program for "apply" As it fails to perform the task (empty__list (1 2)) – because (1 2) is not an empty list – it goes back to see if there is an alternate program for "apply" which there is. Using the alternative program micro-Prolog finds it has to take the first element of each list and execute or "apply" (hence the name I used) the operation you have given it "+" to them – holding onto the result Addition happens to be a built-in program in micro-Prolog but we could have used a user-defined operation The result is put on the end of the result list.

But I bet you could have read the example and almost guessed that – even not knowing micro-Prolog! The last part of the program seems funny It looks like we are using "apply" is a recursive program, which means it calls itself It is a very neat way of getting micro-Prolog to keep doing the same thing over and over again as it moves down a list.

You will have noticed that when micro-Prolog comes to "apply" at the end of the second program, we have only given it the part of the lists that has not been added yet – and the list of results so far Every time round micro-Prolog tries the first program for "apply" Eventually it will find that the first and second lists have no more elements left – the first program ends if that is the case and micro-Prolog succeeds In this explanation we used a simple operation – addition But "apply" would work with a program for use by a doctor to tell whether two drugs in combination were harmful for a patient.

If you found all that a bit technical do not be put off I had to use an example that would show the power of micro-Prolog Fortunately beginners in micro-Prolog are extremely well catered for There are no less than three simplified forms of micro-Prolog that comes on the disc The easiest to use is MITSI (Man In The Street Interface) the second SIMPLE accepts programs in almost-English (SIMPLE is in itself as powerful a relational database language as you could buy) and MICRO is a comprehensive software development tool To make life even easier you get special programs which let you trace your programs as closely as you like (I used these constantly) and another allows you to use your disc drive as part of your program while it is running – useful because micro—Prolog tends to devour memory

To complement this there are some excellent books which will take you from knowing nothing to a good understanding of micro-Prolog See the table

Conclusion

Micro Prolog is now available on under MSDOS CP/M86 and UNIX operating systems so if you want upward "portability" it is there Unlike PASCAL micro-Prolog is an interpreted language which means you can write parts of a program and run them straight away – as you do in BASIC This along with the tracing and debugging programs you get makes it easier to use In my view than BASIC There is a compiler for the 16 bit version if you think you will need to get professional when the new "cheap" 16 bit machines comes onto the market

If you are looking for a language that is going to help you become familiar with the kind of programming that will be widespread by 1990 have a close look at micro-Prolog, it is excellent value for money Although it is not very good for graphics it is good for your programming

Micro-Prolog Buyers Guide

Program Micro-Prolog **Micro** Amstrad CP/M **Price** £69 50 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd London SW18 3SX

Program Micro-Prolog **Micro** Apple II/Apple IIe **Price** £85 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London

Program Micro-Prolog **Micro** BBC B **Price** £79 95 (on Rom) **Supplier** Acornsoft, Betjeman House, 104 Hills Rd Cambridge

Program Micro-Prolog **Micro** Commodore 64 **Price** £69 50 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London SW18 3SX

Program Micro-Prolog **Micro** Any CP/M 80 System **Price** £95 + VAT (incl Manual + Tutorial) **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building Trinity Rd, London.

Program Micro-Prolog 3,1 **Micro** IBM PC **Price** £195 + VAT **Supplier** Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London.

Program Prolog Professional **Micro** IBM PC **Price** £245 + VAT (interpreter only) £485 + VAT (includes Compiler) **Supplier** Logic Programming Associates Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London SW18 3SX

Program MacProlog **Micro** Apple Macintosh **Price** £395 + VAT **Supplier** Logic Programming Associates Studio 4, The Royal Victoria Patriotic Building, Trinity Rd, London SW18 3SX

Program Micro-Prolog **Micro** Spectrum **Price** £24 95 **Supplier** Sinclair Research Milton Hall, Cambridge



DODGEM WITCHES

by Derrick Reid

Can you face up to the task? You must steer your spaceship clear of the manic witches that fly in mad confusion through the sky

This principal purpose of this routine however is not to provide a simple game but to provide the programmer with a machine code sprite movement utility enabling all eight sprites to be moved around the screen with ease. I have placed the routine at the end of the listing to make the task of incorporating it into your own programs easier

The routine forms lines 60000 onwards and should be initialised by *Gosub* 60000 after all the data for the Basic program has been read in

Sprite movement is controlled by one *Sys* command -

Sys 49152 No,XV,YV,XD,YD

where *No* = number of sprite (0 to 7)

XV = horizontal velocity (0 to 255)

YV = vertical velocity (0 to 255)

XD = vertical displacement (-128 to 127)

YD = vertical displacement (-128 to 127)

In the sample game a joystick in port 2 controls your spaceship

```
1 REM*****************************
2 REM*          DODGEM           *
3 REM*  (WITH SPRITE UTILITY)    *
4 REM*  BY DERRICK REID          *
5 REM*****************************
10 FORI=0TO127 READD POKE12280+I,D NEXT
20 V=53248 FORI=0TO7 READD POKEV+39+I,D NEXT
30 M=54272 POKEM+4,16 POKEM+5,0 POKEM+6,240 POKEM,12
40 GOSUB60000
50 PRINT"" POKE53280,0 POKE53281,0
60 FORI=0TO49 P=INT(RND(0)*800) POKE1024+P,46 POKE55296+P,1 NEXT
70 PRINT"    "TAB(12)"          "
80 PRINT"                  "TAB(34)"      "
90 PRINTTAB(34);"$ RIP "
100 FORI=0TO4 PRINTTAB(34),"$     " NEXT
110 C=0 S=60 MC=49152 SC=0 GOSUB4000
200 C=C+40 S=S-.1 SC=SC+1 J=15-(PEEK(56320)AND15)
210 SYSMC,0,1,1,-(JAND4)/4+(JAND8)/8,-(JAND1)+(JAND2)/2
220 IFPEEK(V+30)AND1THEN1000
230 XD=INT(RND(0)*3-1) YD=INT(RND(0)*3-1) IFXD=0ANDYD=0THEN230
240 SYSMC,C/1000+1,1,1,XD,YD
250 IFC=6000THENC=0
260 POKE56325,S
270 GOTO200
1000 FORI=0TO7 SYSMC,I,0,0,0,0 NEXT
1010 POKEV+21,254 POKEV+23,254 POKEV+29,254
1020 PRINT"      ",TAB(12),"  WE WIN AGAIN! "
1030 PRINT"      ",TAB(12),"YOU SCORED -",SC
1040 PRINT"      ",TAB(5),"PRESS ANY KEY FOR ANOTHER GAME"
1050 POKE56325,55
1060 FORI=1TO7 SYSMC,1,1,1,RND(0)*3-1,RND(0)*3-1 NEXT
1070 POKEM+24,15 POKEM+4,17 FORI=0TO250 POKEM+1,1+I NEXT
1080 FORI=250TO0STEP-1 POKEM+1,1+I NEXT POKEM+4,16 POKEM+24,0
1090 GETA$ IFA$=""THEN1060
1100 FORI=0TO7 SYSMC,I,0,0,0,0 NEXT
1110 POKEV+23,0 POKEV+29,0 POKEV+21,0 RUN
4000 FORI=V+3TOV+15STEP2 POKEI,208 NEXT FORI=V+2TOV+14STEP2 POKEI,52 NEXT
4010 POKEV,50 POKEV+1,150
4020 FORI=2041TO2047 POKEI,192 NEXT:POKE2040,193
4030 POKEV+37,1 POKEV+30,0 POKEV+16,254 POKEV+28,1 POKEV+21,255
4040 I=PEEK(V+30) RETURN
5000 DATA1,192,0,0,224,0,15,255,0,2,56,0,36,156,0,26,12,0,5,147,64,3,240,128,7
5010 DATA252,0,59,255,0,65,255,192,1,255,224,3,255,199,7,255,24,255,255,227,0
5020 DATA66,24,0,33,7,1,74,0,0,132,0,0,0,0,0,0,0,
```

```
6000 DATA0,168,0,0,168,0,10,170,128,10,170,128,42,170,160,42,170,160,85,85,84
6010 DATA60,68,68,85,85,84,42,170,160,42,170,160,10,170,128,10,170,128
6020 DATA0,168,0,0,168,0,0,0,0,0,0,0,0,0,0,0,0,0,0,8,0,0,0,0
7000 DATA5,6,1,10,13,4,7,14
60000 FORI=49152TO49361 READA POKEI,A NEXT
60010 SYS49254 60020 RETURN
60999 REM*** SPRITE UTILITY DATA ***
61000 DATA32,253,174,32,158,183
61010 DATA224,8,144,3,76,0,175
61020 DATA138,10,133,253
61030 DATA32,253,174,32,158,183
61040 DATA164,253,138,153,167,2,153,183,2
61050 DATA230,253,32,253,174,32,158,183
61060 DATA164,253,138,153,167,2,153,183,2
61070 DATA198,253,164,253,200,200,132,254
61080 DATA32,253,174,32,138,173,32,170,177
61090 DATA201,255,240,7,152,201,120,176,24
61100 DATA144,7,192,120,144,10
61110 DATA152,73,127,166,253,157,199,2
61120 DATA166,253,232,134,253,228,254,208,215,96
61130 DATA76,8,175
62000 DATA120,169,125,141,20,3,169,192,141,21,3,88,169,0,162,47,157,167,2
63000 DATA202,16,250,96,162,15,169,128,133,252
63010 DATA133,251,189,167,2,240,56
63020 DATA222,183,2,208,51
63030 DATA189,167,2,157,183,2
63040 DATA189,199,2,16,19
63050 DATA41,127,133,2,230,2
63060 DATA189,0,208,56,229,2
63070 DATA157,0,208,144,11,176,21
63080 DATA24,125,0,208,157,0,208
63090 DATA144,12,165,251,208,8,165,252
63100 DATA77,16,208,141,16,208
63110 DATA165,251,208,2,78,252,73,128,133,251 63120 DATA202,16,182,76,49,234
```


SIMULTANEOUS EQUATIONS

by F R Richardson

This program, for the QL will solve just about any set of linear simultaneous equations whether there are just two unknowns or whether there are 50 or more Furthermore the equations are keyed into the computer in exactly the same way as you would write them down on paper, eg if one of the equations was X+3Y-Z=4 then that is what you would type in – the program understands that you mean '1' times X' Another bonus is that you can any alphabetic symbols you wish upper or lower case, to represent the unknowns

I have tried to make the program as easy to use as possible and perhaps the easiest way to explain it is by example Suppose you wanted to solve the following set of equations -

5a+3b-3c=48
2a+6b-3c=18
5a-3b+2c=21

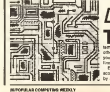
After loading the program and running it, you would be asked *How Many Unknowns?* There are three of course, a, b, and c so you type 3 *(Enter)* Then the computer will ask you to type in equation one and you oblige by typing in the top equation exactly as it is written above Similarly you type in the other equations when prompted After a few seconds if you have typed in the program correctly you will be informed that the answers are a=3 b=5 and c=6 Easy!

Here are a few notes of extra guidance Firstly you should always put the "unknowns" on the left-hand-side of the equations (quite usual anyway) Secondly the number of equations must equal the number of unknowns Finally it is not always possible to solve a set of linear equations no matter what method you use In this instance the computer will inform you that no solution is possible

For those who are intent on unravelling the mysteries of the program, I should say that I have converted the input data into determinants and used Cramer's Rule to solve the equations The determinants being held as strings I should be very interested to learn if anyone has produced a simpler method for achieving the same result

If you are interested in the program but lack the time or energy to type it in yourself I should be glad to supply a copy of it Just send a formatted cartridge and £2 to me at 22 Avon Crescent Alcester, Wark B49 6BJ

```
120 REMark BY F.B. RICHARDSON
130 CLS
135 REMark INPUT DETAILS OF EQUATIONS
138 INPUT "HOW MANY UNKNOWNS ? ";unknowns
140 DIM equ$(unknowns,unknowns*11),lines$(unknowns,
4*unknowns^2),variable$(unknowns,1)
150 FOR equ=1 TO unknowns
160   PRINT "TYPE IN EQUATION NO ";equ;" : ";
170   INPUT equ$
180   IF equ=1 THEN note_variables equ$,variable$
190   get_data lequ$ unknowns,equ
200 END FOR equ
205 REMark MAKE DETERMINANTS AND PUT INTO STRINGS
210 FOR n=0 TO unknowns
220   FOR n=1 TO unknowns
230     FOR p=1 TO unknowns
240       IF p=n THEN
250         lines$(a)=lines$(a)&nos$(n,unknowns+1)&",",
260       ELSE
270         lines$(a)=lines$(a)&nos$(n,p)&",",
280       END IF
290     END FOR p
300     lines$(a)=lines$(a)(1 TO LEN(lines$(a))-1)&"*"
310   END FOR n
320   lines$(a)=lines$(a)(1 TO LEN(lines$(a))-1)&"?"
330 END FOR a
340 REMark CALCULATE THE VALUES OF EACH DETERMINANT
345 FOR soln=0 TO unknowns
347   a$=lines$(soln)
350   rod$=""
360   REPeat expand
370     dsc_order a$
380     IF order=2 THEN EXIT expand
390     REPeat cutter
400       take_substring$ sb$
410       rd_to_array order rd$
420       transform order rod$,rod
430       IF a$="" THEN EXIT cutter
440     END REPeat cutter
450     a$=rod
460     rod$=""
470   END REPeat expand
480   total=0
490   REPeat totaller
500     take_substring$ a$
510     rd_to_array order,sb$
520     total=total+sum(1) (1*det(2,2)-det(1,2)*det(2,1)
530     IF a$="" THEN EXIT totaller
540   END REPeat totaller
551   IF total=0 THEN PRINT "NO SOLUTION POSSIBLE":STOP
552   IF soln=0 THEN nothe=total
556   IF soln<>0 THEN PRINT var(a$(a$(soln),"
= ";total/botm
556 END FOR soln
560 STOP
570 DEFine PROCedure dsc_order (a$)
580   position=1:order=1
590   REPeat no_counter
600     IF a$(position)="*" THEN EXIT no_counter
610     IF a$(position)="," THEN order=order+1
630     position=position+1
630   END REPeat no_counter
640 END DEFine
650 DEFine PROCedure take_substring$ (sb$)
660   position=1:sb$=""
670   REPeat taker
680     IF a$(position)="?" THEN EXIT taker
690     IF a$(position)="*" THEN
700       sb$=sb$&" "
710     ELSE
720       sb$=sb$&a$(position)
730     END IF
740     position=position+1
750   END REPeat taker
760   IF LEN(sb$)=LEN(a$)-1 THEN
770     a$=""
780   ELSE
790     a$=a$(position+1 TO)
800   END IF
810 END DEFine
820 DEFine PROCedure rd_to_array (order,sb$)
830   DIM det(order,order)
840   place=0
850   FOR i=1 TO order
860     FOR j=1 TO order
870       temp$=""
880       REPeat no
890         place=place+1
900         IF place>LEN(sb$) THEN EXIT no
910         IF sb$(place)=" " THEN EXIT no
920         temp$=temp$&sb$(place)
930       END REPeat no
940       det(i,j)=temp$
950     NEXT j
960   NEXT i
970 END DEFine
980 DEFine PROCedure transform (order,rod$,det)
990   sign=1
1000   FOR n=1 TO order
1010     FOR p=1 TO order
1020       IF n=p THEN
1030         IF p=order THEN
1040           rod$=rod$(1 TO LEN(rod$)-1)&"*"
1050           EXIT p
1060         ELSE
1070           NEXT p
1080         END IF
1090       END IF
1100       rod$=rod$&(sign*(det(1 n)*det(2,p)))
1110       IF p=order THEN
1120         rod$ rod$&","
1130       ELSE
1140         rod$=rod$&"*"
1150       END IF
1160     END FOR p
1170     FOR r=3 TO order
1180       FOR s=1 TO order
1190         IF s=n THEN
1200           NEXT s
1210         ELSE
1220           rod$=rod$&det(r,s)&","
1230         END IF
1240       END FOR s
1250       rod$=rod$(1 TO LEN(rod$)-1)&"*"
1260     END FOR r
1270     rod$=rod$(1 TO LEN(rod$) )&"?"
1280     sign=-sign
1290   END FOR n
1300 END DEFine
2000 DEFine PROCedure note_variables (equ$,variable$)
2010   count=1
2020   FOR n=1 TO LEN(equ$)
2030     IF (equ$(n)>="a" AND equ$(n)<="z") OR (equ$(n)>="A"
AND equ$(n)<="Z") THEN
2040       variable$(count)=equ$(n)
2050       count=count+1
2060     ELSE
2070     END IF
2080   END FOR n
2090 END DEFine
2100 DEFine PROCedure get_data (equ$ unknowns,equ)
2110   IF equ$(1)<>"+" AND equ$(1)<>"-" THEN equ$="+"&equ$
2120   supplied_ones equ$
2130   take_nos unknowns,equ$,nos,equ
2140 END DEFine
2150 DEFine PROCedure supplied_ones (equ$)
2160   tot$=""
2170   FOR chr=1 TO LEN(equ$) )
2180     IF (equ$(chr)="+" OR equ$(chr)="-") AND (equ$(chr+1)
<"0" OR equ$(chr+1)>"9") THEN
2190       and$=and$&equ$(chr)&"1"
2200     ELSE
2210       IF equ$(chr)="=" AND equ$(chr+1)<>"+" AND
equ$(chr+1)<>"-" THEN
2220         and$=and$&equ$(chr)&"+"
2230       ELSE
2240         and$=and$&equ$(chr)
2250       END IF
2260     END IF
2270   END FOR chr
2280   and$=and$&equ$(LEN(equ$))&"q"
2290 END DEFine
2300 DEFine PROCedure take_nos (unknowns equ$,nos,equ)
2310   spot=1
2320   FOR n=1 TO unknowns+1
2330     temp$=""
2340     REPeat chopper
2350       IF (equ$(spot)>="a" AND equ$(equ$)(<"z") OR
(equ$(spot)>="A" AND equ$(spot)(<"Z") THEN
2360         spot=spot+1
2370         EXIT chopper
2380       ELSE
2390         temp$=temp$&equ$(spot)
2400         spot=spot+1
2410       END IF
2420     END REPeat chopper
2430     IF temp$(1)="+" THEN temp$=temp$(2 TO)
2440     nos(equ,n)=temp$
2450   END FOR n
2460 END DEFine
```

DEBUGGIN'

by T A Bartley

This is a grid game where your hero has to neutralise all the magnetic cores in an ancient computer system. However, the logic bombers have other ideas and they try to put the bite on you by sending logic bombs along the data lines.

Every time you complete a screen your score is added to the total so far, followed by a bonus screen which doesn't have to be completed to score points. There are eleven screens, each followed by a bonus screen, making a grand total of 22. Speed is selected from a range of one to five, the faster speeds being worth more points but, of course, making the game harder.

You can use either the cursor keys or a joystick to control your buggy and, during the game, you can pause by pressing H. Restart by pressing the space bar.

Program 1 is the Basic loader for the machine code, when it's finally typed in. Type in the loader and save it under the file name *"Debuggin"*. Program 2 is the decimal loader for entering the actual machine code and should be typed in and then run.

Now the data, all 3896 bytes of it, should be carefully entered. However, because of the large amount of data to be entered this is being split over two weeks. Use the command Save *"Debugcode", B 31000 2048.*

The checksum for the first block of data is 166943. More next week.

If you can't face the prospect of all that typing then send £2.00 to me at 81 Beverley Crescent, Grimsby, S Humberside DN32 9TJ.

```
10 '*********************************
20 '
30 ' PROGRAM 1: BASIC LOADER FOR GAME
40 '
50 '*********************************
60 MEMORY 30999
70 INK 0,1:INK 1,24:PAPER 0:BORDER 1:CLS:MODE 1
80 LOCATE 8,10
90 PRINT "DEBUGGIN' by T A Bratley"
100 LOCATE 12,14
110 PRINT "Copyright 1986 "
120 LOAD "!DEBUGCODE",31000
130 CALL 31863
140 '*********************************
150 '
160 ' PROGRAM 2: DECIMAL LOADER
170 '
180 '*********************************
190 MODE 2
200 total=0
210 FOR n=31000 TO 33048
220 INPUT i
230 PRINT n,i
240 POKE n,i
250 total=total+i
260 NEXT n
270 PRINT "Checksum = ";total
280 STOP
```

31000	0	16	32	0	0	16	32	0	= 96
31008	0	64	40	0	16	40	40	0	= 200
31016	0	32	16	0	16	32	16	32	= 144
31024	40	32	16	40	32	32	16	16	= 240
31032	32	32	16	16	40	32	16	40	= 240
31040	16	32	16	32	0	32	16	0	= 144
31048	16	40	40	32	0	40	40	0	= 240
31056	0	16	32	0	0	16	32	0	= 96
31064	40	0	0	0	16	32	32	0	= 120
31072	40	40	40	0	0	0	40	40	= 240
31080	0	0	40	40	40	40	40	0	= 240
31088	16	32	32	0	40	0	0	0	= 120
31096	0	0	0	40	0	16	16	32	= 112
31104	0	40	40	40	40	40	0	0	= 240
31112	40	40	0	0	0	40	40	40	= 200
31120	0	16	16	32	0	0	0	48	= 112
31128	160	64	136	24	252	152	152	252	= 1230
31136	84	252	252	160	84	160	84	140	= 1260
31144	0	252	252	0	0	132	72	0	= 708
31152	0	64	128	0	0	64	128	0	= 384
31160	0	48	128	0	0	64	128	0	= 384
31168	0	132	72	0	0	252	252	0	= 708
31176	84	140	84	160	84	252	252	168	= 1200
31184	252	152	152	252	160	64	136	84	= 1252
31192	252	0	0	0	84	252	0	0	= 588
31200	64	252	252	0	192	168	172	192	= 1272
31208	192	168	172	192	64	252	252	0	= 1292
31216	84	252	0	0	252	0	0	0	= 588
31224	0	0	0	252	0	0	252	168	= 672
31232	0	212	252	128	192	92	84	192	= 1152
31240	192	92	84	192	0	212	252	128	= 1152
31248	0	0	252	168	0	0	0	252	= 676
31256	0	3	1	2	0	3	1	2	= 12
31264	0	1	1	3	1	3	3	0	= 12
31272	0	1	3	0	0	1	3	0	= 8
31280	0	1	3	0	0	0	2	0	= 6
31288	0	0	2	0	0	1	3	0	= 6
31296	0	1	3	0	0	1	3	0	= 8
31304	1	3	3	3	0	1	1	0	= 12
31312	0	3	1	2	0	3	1	2	= 12
31320	0	1	0	0	3	1	0	0	= 5
31328	3	3	3	2	0	1	3	3	= 18
31336	3	3	3	2	3	1	0	0	= 15
31344	0	1	0	0	0	0	0	0	= 1
31352	0	0	2	0	0	0	2	3	= 7
31360	1	3	3	3	3	3	2	0	= 18
31368	1	2	3	3	0	0	3	3	= 15
31376	0	0	2	0	0	0	0	0	= 2
31384	0	0	128	0	0	0	128	0	= 256
31392	0	0	128	0	0	0	128	0	= 256
31400	192	192	192	192	0	0	128	0	= 896
31408	0	0	128	0	0	0	128	0	= 256
31416	0	0	0	0	0	12	12	0	= 24
31424	4	12	4	12	4	8	0	12	= 56
31432	4	0	0	12	4	8	0	12	= 40
31440	4	12	12	12	0	12	12	0	= 72
31448	0	0	10	14	10	14	0	0	= 48
31456	0	0	0	0	0	0	0	0	= 0
31464	0	0	0	0	0	0	0	0	= 0
31472	0	0	0	0	0	0	0	0	= 0
31480	0	0	0	0	0	0	0	0	= 0
31488	0	0	0	0	0	0	0	0	= 0
31496	0	0	0	0	0	0	0	0	= 0
31504	0	0	0	0	0	0	0	0	= 0
31512	0	0	0	0	0	0	0	0	= 0
31520	0	0	0	0	0	0	0	0	= 0
31528	0	0	0	0	0	0	0	0	= 0
31536	0	0	0	0	0	0	0	0	= 0
31544	0	0	0	0	0	0	0	0	= 0
31552	0	0	0	0	0	0	0	0	= 0
31560	0	0	0	0	0	0	0	0	= 0
31568	0	0	0	0	0	0	0	0	= 0
31576	0	0	0	0	0	0	0	0	= 0
31584	0	0	0	0	0	0	0	0	= 0
31592	0	0	0	0	0	0	0	0	= 0
31600	0	0	0	0	0	0	0	0	= 0
31608	0	0	0	0	0	0	0	0	= 0

31616	0	0	0	0	0	0	0	0	= 0
31624	0	0	0	0	0	0	0	0	= 0
31632	0	0	0	0	0	0	0	0	= 0
31640	0	1	1	18	18	14	14	14	= 80
31648	24	26	24	26	26	26	26	15	= 193
31656	15	6	26	6	26	6	26	17	= 128
31664	139	130	175	245	26	21	19	26	= 830
31672	79	19	241	245	213	200	50	188	= 1240
31680	200	241	64	254	13	32	224	6	= 1049
31688	1	72	205	56	200	175	205	120	= 1052
31696	187	42	1	205	14	160	62	80	= 796
31704	50	229	122	42	1	40	201	122	= 860
31712	200	144	187	33	205	192	34	225	= 1260
31720	122	1	25	0	17	185	101	33	= 514
31728	4	40	205	172	132	33	127	194	= 907
31736	34	227	122	1	25	0	17	205	= 649
31744	133	33	0	1	205	215	132	30	= 750
31752	112	195	34	202	122	1	27	0	= 716
31760	17	237	131	33	12	40	205	172	= 847
31768	132	20	230	196	30	227	122	1	= 1000
31776	30	0	17	30	132	33	16	1	= 258
31784	205	215	130	6	1	62	64	205	= 888
31792	30	187	22	30	4	62	65	205	= 617
31800	30	182	32	24	4	60	57	205	= 601
31808	30	187	32	16	4	62	56	205	= 592
31816	30	187	22	0	4	42	49	205	= 572
31824	30	187	40	215	120	50	223	122	= 987
31832	175	33	50	70	17	200	7	227	= 887
31840	82	16	252	34	216	122	33	207	= 962
31848	190	34	227	122	1	30	0	17	= 642
31856	187	132	33	25	1	205	215	132	= 878
31864	62	47	205	38	187	80	205	175	= 995
31872	205	24	182	47	199	130	221	75	= 1080
31880	187	130	237	65	80	4	237	87	= 895
31888	180	130	50	187	130	20	188	156	= 814
31896	50	188	130	50	181	130	42	2	= 630
31904	201	144	187	205	130	130	62	5	= 1000

31912	205	144	187	205	173	130	205	193	= 1442
31920	130	62	1	50	87	130	50	231	= 741
31928	122	42	6	50	31	130	205	213	= 899
31936	130	205	252	130	205	14	126	42	= 1009
31944	187	130	237	91	180	130	25	34	= 854
31952	187	130	205	173	190	175	50	230	= 1306
31960	122	50	188	130	50	181	130	205	= 1056
31968	86	126	50	231	122	80	50	126	= 1040
31976	62	14	50	219	122	50	221	122	= 860
31984	71	62	18	50	210	122	50	196	= 805
31992	122	75	205	2	129	175	201	27	= 946
32000	129	205	160	120	205	201	127	205	= 1272
32008	205	126	237	75	216	122	205	0	= 1194
32016	126	40	44	205	30	187	40	7	= 201
32024	62	47	205	30	187	40	245	50	= 898
32032	252	122	187	32	36	50	231	132	= 399
32040	254	12	40	4	62	12	24	12	= 420
32048	50	87	130	40	50	87	130	254	= 808
32056	12	202	217	125	50	221	122	205	= 1164
32064	25	126	205	183	129	109	190	130	= 1097
32072	50	230	122	167	80	100	30	91	= 848
32080	130	41	50	91	130	40	42	205	= 749
32088	180	131	205	25	126	200	30	129	= 800
32096	30	231	122	254	12	32	17	30	= 208
32104	87	130	80	50	87	130	50	203	= 825
32112	122	254	12	40	180	195	190	124	= 1037
32120	33	0	0	34	180	120	150	190	= 800
32128	124	205	160	193	200	25	126	205	= 1129
32136	180	129	42	1	50	224	122	201	= 888
32144	14	180	42	80	50	229	122	175	= 920
32152	42	180	130	237	91	187	130	237	= 1203
32160	82	80	0	1	36	0	17	31	= 222
32168	130	24	6	1	33	0	17	67	= 208
32176	130	50	112	190	34	225	122	33	= 888
32184	12	40	205	172	120	30	205	199	= 1000
32192	34	227	122	1	30	0	17	127	= 208
32200	132	33	25	0	205	215	132	42	= 800

32208	47	202	38	187	48	249	196	208	=	1162
32216	128	129	205	14	160	39	12	7	=	757
32224	17	126	132	6	0	205	253	128	=	880
32232	30	24	6	17	143	139	8	10	=	381
32240	205	253	130	32	17	1	17	153	=	808
32248	132	6	19	205	253	128	62	47	=	854
32256	205	38	103	40	201	198	205	123	=	1230
32264	11	128	177	30	221	205	30	180	=	1022
32272	128	1	60	9	17	93	123	207	=	639
32280	176	237	75	93	123	205	2	126	=	1346
32288	62	4	205	23	129	208	168	128	=	924
32296	237	75	188	123	205	2	129	62	=	941
32304	5	202	29	129	205	164	128	223	=	1185
32312	75	123	123	205	2	128	62	6	=	728
32320	208	25	137	205	160	128	227	75	=	1170
32328	128	127	205	2	128	62	7	205	=	871
32336	23	128	205	160	128	205	50	113	=	1008
32344	126	167	40	5	75	79	30	16	=	538
32352	202	94	35	86	228	17	208	128	=	1070
32360	1	117	0	237	176	205	146	128	=	1000
32368	201	128	126	2	120	64	133	160	=	964
32376	133	230	130	9	134	50	134	107	=	931
32384	138	230	134	12	128	40	135	128	=	947
32392	120	207	128	0	1	2	5	10	=	383
32400	20	12	201	31	220	130	201	70	=	838
32408	0	205	30	197	221	126	4	205	=	1085
32416	23	128	221	70	0	221	70	1	=	743
32424	205	2	128	221	70	7	197	205	=	1050
32432	221	70	7	201	165	130	35	35	=	864
32440	30	35	16	247	222	1	90	0	=	128
32448	9	193	16	234	1	0	0	221	=	679
32456	9	193	16	207	204	101	33	93	=	573
32464	120	6	4	197	221	121	205	120	=	1213
32472	128	221	228	1	15	0	221	9	=	810
32480	193	15	246	208	201	208	6	78	=	1130
32488	30	55	58	216	122	221	198	0	=	236
32496	68	87	58	219	122	221	158	1	=	930
32504	40	79	221	53	0	40	51	221	=	705
32512	78	0	221	70	1	205	2	129	=	706
32520	201	126	5	205	221	126	205	160	=	1001
32528	128	221	128	0	221	126	2	221	=	1053
32536	119	0	79	205	126	1	201	134	=	980
32544	3	221	119	1	71	205	2	128	=	750
32552	201	126	5	205	23	126	205	160	=	1081
32560	128	208	221	126	2	237	60	221	=	1204
32568	119	2	201	126	3	237	60	221	=	987
32576	119	3	221	126	12	221	219	4	=	923
32584	201	221	205	6	90	20	27	221	=	998
32592	54	6	1	201	128	0	201	134	=	763
32600	9	221	119	7	221	120	1	201	=	925
32608	104	10	221	219	0	205	81	138	=	899
32616	24	3	205	175	127	50	218	122	=	932
32624	221	198	7	20	0	50	219	122	=	861
32632	221	198	0	40	74	221	126	7	=	881
32640	220	134	9	221	119	2	202	198	=	1098
32648	0	221	134	10	201	117	0	50	=	771
32656	210	120	221	198	7	50	0	36	=	780
32664	219	122	221	198	0	46	40	221	=	1064
32672	116	2	227	198	13	40	27	221	=	845
32680	128	9	201	198	14	40	19	221	=	830
32688	39	7	221	70	0	205	2	129	=	728
32696	221	126	11	205	23	128	205	160	=	1088
32704	130	201	221	54	5	0	201	62	=	873
32712	1	50	238	122	205	62	0	201	=	873
32720	30	107	32	7	60	72	208	38	=	622
32728	207	60	14	50	221	127	224	5	=	908
32736	208	61	50	219	127	62	0	25	=	738
32744	81	62	2	201	36	187	31	7	=	580
32752	47	73	205	30	140	48	11	50	=	604
32760	201	120	236	24	205	60	50	219	=	1150
32768	122	33	1	24	53	62	0	205	=	500
32776	30	107	30	7	62	74	205	30	=	627
32784	107	48	14	58	228	130	254	2	=	887
32792	205	62	30	219	122	62	3	24	=	740
32800	25	62	1	201	38	187	50	6	=	545
32808	62	75	205	38	107	206	58	220	=	1037
32816	127	229	19	205	60	50	211	122	=	1045
32824	62	2	58	222	122	201	75	220	=	980
32832	122	205	2	128	62	12	201	23	=	808
32840	129	208	139	120	30	219	122	30	=	1058
32848	221	122	71	50	210	127	50	205	=	1007
32856	127	79	201	2	129	205	35	6	=	801
32864	9	120	254	12	40	6	124	150	=	728
32872	9	101	16	245	24	20	20	222	=	808
32880	122	53	205	62	131	42	186	130	=	891
32888	34	206	120	95	22	0	25	34	=	579
32896	180	130	38	222	127	205	29	124	=	1088
32904	220	24	20	220	217	197	205	5	=	1108
32912	0	192	6	4	229	26	117	30	=	134
32920	19	86	205	221	124	180	0	180	=	943
32928	193	16	208	241	193	208	123	201	=	1516
32936	125	213	197	245	6	0	197	4	=	1101
32944	0	221	30	174	118	25	19	16	=	123
32952	200	221	124	198	0	103	198	66	=	1156
32960	227	241	193	205	225	201	2	4	=	1383
32968	1	9	50	4	0	0	0	0	=	23
32976	1	0	10	0	24	19	20	220	=	308
32984	0	20	5	0	0	0	0	255	=	279
32992	9	16	0	4	1	24	0	250	=	301
33000	20	6	0	0	0	1	0	10	=	37
33008	20	10	0	20	5	0	1	20	=	86
33016	7	0	0	0	205	0	11	70	=	303
33024	2	0	203	30	120	100	17	100	=	712
33032	0	20	16	200	12	89	205	19	=	610
33040	003	10	22	0	25	204	200	17	=	790

INPUT MATCH

by Steven Underwood

One of the most powerful features of any computer is its ability to compare two items and to make a decision on the result. One of the most common demands made upon a computer is to compare a word inputted with a list of words already in memory and once matched carry out the associated task.

This is heavily used in adventure games and any program that doesn't want to limit its user input to *number* driven menus. From Basic this is a simple task with lines of the form

If A$= One Then

However, from machine code it is a much more complicated matter although still a highly desirable one. A program to do just that in 68000 machine code on the ST is presented here.

Lines that begin with a ; are comments and need not be typed in, lines that end with a : *must* be typed in as these are labels. The program will work on other 68000 computers provided that the *input* routine is replaced with an alternative one (lines 1-13) unless they also use GEM.

The program returns a zero in register *D0* if no match is found, or else the number of the word in the list that matched the typed in word. This can then be used by your program to carry out the correct action. The list of words can be added to limited only by size of the memory of your computer! However, each word must be terminated with a 13 byte and after the last word a 0 byte must be added to let the program know it has reached the end of the list.

Lines three to eight use the GEMDOS *Call#10* to *Input* a line of text up to 255 characters long. Since the list of words uses a 13 to mark their end a 13 byte has to be added to the word typed in and this is done in lines nine to 13.

Line 15 sets the word counter register *D0* to one and lines 17 to 21 set up the registers A0-A4 so that they point at the list of words in memory (A2,A3) and the word typed in (A0,A1). Two registers are used in each case because each time the program loops round it loses its starting point.

The main comparing loop is between lines 23 and 41. This compares each letter of the typed in word with the first word in memory, and then with each word in turn until the program either finds a match (Line 36) or runs out of match words (Line 39). Each time the program loops round D0 is increased by one (line 30) and in the case of no match is reset to zero (Line 40).

Lines 43 to 53 are the list of match words and line 55 at the end of the program, is where the typed in word is stored in memory. If you use this program as a subroutine in your own, ensure that lines 55 onwards appear at the very end of your program and not in the middle! Otherwise the word typed in will be placed over part of your program and crash it!

```
1  START
2  ;INPUT A WORD
3  MOVE B#255 BUFFER
4  MOVE L#BUFFER,-(SP)
5  MOVE W#10,-(SP)
6  TRAP#1
7  ADDQ L#6,SP
8  ;A0 IS TO THE END OF THE INPUTED
   WORD
9  MOVE L#2,D0
10 MOVE L#BUFFER,A0
11 ADD B (A0),D0
12 ADD L D0,A0
13 MOVE B#13,(A0)
14 ;SET UP REGISTERS FOR THE MATCH
15 ;SET D0 COUNTER TO ONE TO START WITH
16 MOVE L#1,D0
17 ;POINT TO INPUTED WORD
18 MOVE L#BUFFERSTART,A0
19 MOVE L A0 A1
20 MOVE L#MATCH,A2
   ;POINTS TO LIST OF WORDS IN MEMORY
21 MOVE L A2 A3
22 ;MAIN COMPARING LOOP
23 AROUND:
24 CMPM B (A0)+,(A2)+
25 BEQ DOWN
26 MINI: CMP #0,(A2)
27 BEQ NOMATCH
28 CMP B#13,(A2)+
29 BNE MINI
30 ADDQ#1,D0
31 MOVE L A1,A0
32 JMP AROUND
33 DOWN:
34 CMP B#13 (A0)
35 BNE AROUND
36 ;WORD MATCHES THE ROUTINE WITH NUMBER
   OF MATCH IN D0
37 RTS
38 NOMATCH:
39 ;NO WORD MATCHED SO RETURN ZERO IN D0
40 MOVE L#0,D0
41 RTS
42 ;HERE IS THE LIST OF WORDS TO MATCH WITH
43 MATCH:
44 D C B "ONE"
45 D C B 13
46 D C B "TWO"
47 D C B 13
48 D C B "THREE"
49 D C B 13
50 D C B "FOUR"
51 D C B 13
52 ;TERMINATING ZERO BYTE OF MATCH WORDS
53 D.C.B 0
54 ;INPUTED WORD STORED HERE
55 BUFFER:
56 ;DUMMY TWO BYTES
57 D W 0
58 BUFFERSTART:
```

Programming: Peek & Poke

ST colour

Paul Lambert of Maida Vale, London W9 writes

Q **I am intending to buy an Atari 520 STM but now that I have found out that it can only support low resolution when using television, I also want to buy a monitor.**

What I want to know is that if I buy a colour monitor such as the Chrome I from Chromagraphics, which boasts 895 × 585 pixels, can it be used with all the graphics modes on the ST including the monochrome 640 × 400 pixels? If not, are there any other monitors which can support both colour and monochrome displays?

A One of the main problems with the ST is its monitor output (see *Popular Computing Weekly, Vol 5 No 23*) as there are two separate outputs one for monochrome and one for colour. The colour signal is standard RGB unfortunately the mono output is 70Hz and so will not work with anything except a special monitor (Atari SM124). The advantage of the mono display being at 70Hz (most British micros are at 50Hz) is that the picture is rock steady and very clear.

As far as I know there are no monitors that can cope with both 70Hz mono and standard RGBs so your only solution is to buy the SM124 if you want the high res mono picture. This will cost you £478 for the STM plus mono monitor, the price you pay for a *'leading edge'* machine.

Sprite approach to MSX

M Alvey of Abingdon, Oxfordshire writes

Q **I have had an MSX machine for a year or so now, and have finally become interested in programming. After messing around with the sprites, I have noticed that it is not possible to have more than four sprites in a row across the screen. How can I find out which sprite has not been displayed?**

Could you also recommend a good book about the MSX.

A Unfortunately, one of the limitations of the MSX sprite system is that it only allows four sprites to be placed across the screen at one time. Using the *VDP* command it is possible to work out which sprite is violating this.

PRINT VDP(8) AND 31 tells you which sprite it is and *PRINT VDP(8) AND 64* can be used to find out if the rule is being broken (gives 64 if there are more than four sprites across the screen, zero otherwise).

The best book on the subject is *The Complete MSX Programmers Guide* from Melbourne House.

On spec

C Baker of Hounslow, Middlesex writes

Q **I own a Spectrum Plus and am having a little difficulty which, I hope, you can sort out for me.**

I am writing a program to ask a set of questions. How do I set up an array to store 100 questions and answers? I have the manual but the arrays don't seem to work.

A One of the stranger things about the Spectrum Basic is the way in which string arrays are defined. Unlike most other Basics, you need to specify the length of the string (number of characters it will hold) as well as the number of strings in the array. This effectively adds an extra dimension to the array definition.

In most standard Basics, DIM Q$(100) tells the computer to set aside a dynamic amount of space (all the strings are of zero length until something is put into them) for 100 strings. On the Spectrum you will need to work out which is the longest question and then set up the string with array with that size eg, say the longest question consists of 20 characters then the array definition will be *DIM Q$(100,20)*. This tells the computer to set aside space for 100 rows of *20* characters each, about 20K bytes. You will then need to do the same for your answers, hence an array of *DIM A$(100,20)*. The problem is, on the Spectrum all of this space is set aside, not leaving very much room if any, for the program. You will need to keep the questions short, perhaps by making them all have the same intro, eg 'What is' and then the question string.

The confusion begins when you actually need to access a string array. If you want the complete contents of the string, simply use *Q$(n)* where *n* is the question number. If, however, you want a section of a line of the array the length of the string is needed. So if Q$(1) is 'What is your name', *PRINT Q$(1)* gives 'What is your name' while *PRINT Q$(1,1-7)* gives 'What is'. Hopefully this makes things a little clearer.

Which one?

P R Grove of Coulsdon, Surrey writes

Q **We are looking for a new computer capable of running a wordprocessor, database and the occasional game. The main contenders are the Amstrad CPC 6128, PCW 8512, or PCW 8256. Which one would you recommend?**

Could you also give the names of a good wordprocessor and database for the 6128? Do you think that it worth buying the colour monitor instead of the green monitor?

A The computer games market currently produces games mainly for the CPC range of Amstrad micros, the PCW range is only covered by a few (though this is changing) software houses. From this point of view, the better computer to buy is probably the 6128 except that you will need to buy a printer as well.

Pocket Wordstar is a reasonably good wordprocessor at £50 from Micropro. It has years of experienced users to write manuals to help you learn what is essentially a fairly straightforward system.

Cardbox is a pretty simple database at £100 from Caxton. Again, it has been around for quite a while but lacks many advanced features one would expect from a database such as being able to get totals from sets of figures, etc. It is however, very simple to use and is handy for quick access to phone numbers, addresses, etc.

It may be better to have a look around the Amstrad mags and then go to a dealer and see a package in action before buying, at least you know what you're getting. Another alternative might be to wait and see if Amstrad's rumoured IBM clone appears in the near future since there are a number of games and vast quantities of good software available for IBM machines.

If you are thinking of playing the occasional game with your Amstrad, a colour monitor is the better buy. Unfortunately, for business applications it can sometimes be a little blurred.

Other games

Alan Franklin of Victoria, London SW1 writes

Q **I have a Spectrum Plus and hundreds of ZX81 games. I wonder if you could please tell me how to run ZX81 games programs on the Spectrum Plus.**

A The most obvious answer to this is, forget it, you can't run ZX81 programs on the Spectrum Plus. The differences between the two machines are quite major.

Having said that, it may be possible to write some software to allow the Spectrum to emulate the ZX81, and interpret the ZX81 instructions. However, I don't know of any commercial software to do this so you'd have to do it yourself (not easy).

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2H 3LD

Screen Handler on QL
by Doug Lockhart

Having used a BBC recently I came to prefer that machine's screen handling over the QL's. The idea that you can use the whole of the screen rather than a measly four lines makes more sense.

Having reached this conclusion I decided to write a program to do just that. The program's only limitation is that all display commands such as *Print* and *List* must be suffixed by 0 (hash zero comma). If this is not done, then the screens may clash and output will not be directed to the appropriate part of the screen.

```
10 FOR a=0 TO 2
20 CLOSE #a
30 OPEN #a,con_452x236a30x10
40 MODE 4
50 PAPER #a,0
60 INK #a,7
70 CLS #a
80 END FOR a
90 PRINT #1."BBC BASIC 32K"
100 PRINT #0\\\\
```

Memory Exposed on BBC
by Mark Lucknam

The following program provides a quick and easy method of examining the contents of memory. When run, the program asks for the start location of the dump, which should be entered as a decimal number. The option of using a printer is given but you should be aware of the fact that some printers do not provide a carriage return automatically. In this case the command, **Fx6 0* should be entered before running the program.

Pressing the space bar will dump each subsequent location, its contents and the Ascii character it represents. If the memory location contains a value of 31 or less it is represented as "??" to avoid crashing the program.

Pressing 'Q' exits from dump, turning the printer off and resetting the text window as it goes.

```
10CLS:INPUT"Enter start location ";A%
20PRINT"  Dump to printer ? (Y/N)":B%=GET:CLS
30PRINTTAB(13);:IFB%=89ORB%=121PRINT"Printer ON"ELSEPRINT"Printer OFF"
40PRINTCHR$129CHR$157CHR$131;"Location  Contains  Character"
50VDU28,0,24,39,2
60IFB%=89ORB%=121VDU2
70FORC%=A%TO65535
80PRINTTAB(5);C%;TAB(16);?C%;TAB(26);
90IF?C%<32PRINT"??"ELSEPRINTCHR$(?C%)
100*FX21,6
110B%=GET:IFB%=81VDU3,26:PRINTTAB(0,24);:END:ELSENEXT
```

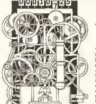
Printer Shades on Spectrum
by P Hiley

This utility produces a fully shaded screen *copy* on an ordinary ZX printer. Although it has not been tested with thermal replacements for the ZX printer (eg: the Alphacom), it may work with those which allow the normal *Copy* command to be used.

After running the hex loader, save it with *Save "shade" Code 1252 128*. It can be reloaded to any address using *Load "" Code (address)*, and is executed by *Randomize Usr (address)*.

As the contrast of the image is fairly poor, a dark picture may be improved by producing a negative image, so load in the routine and type *Poke ad+55 3: Poke ad+56 0: Poke ad+65 2* where ad is the start address. These values are normally 29, 237 and 2 respectively.

```
1 REM ** 'Printer Shade.'**
2 REM      (c) P.Hiley.
5 DEF FN V(A$)=CODE A$-55+(7 AND A$<"A")
6 REM Note the capital "A"
10 LET AD=4E4: REM Start address.
20 READ A$,S
30 IF A$="" THEN  GO TO 9999
40 LET C=0: FOR L=1 TO 16 STEP 2
50 LET N=FN V(A$(L))*16+FN V(A$(L+1))
60 POKE AD,N
70 LET C=C+N: LET AD=AD+1
80 NEXT L
90 IF S<>C THEN  PRINT "ERROR"'A$: STOP
100 GO TO 20
199 REM Use Caps Lock for the Data.
200 DATA "F3010000DD210050",762
210 DATA "C570FE039FE6025F",1060
220 DATA "D3FB05C3AA22D8FB",1346
225 REM
230 DATA "87CB7F2803FBCF12",984
240 DATA "30F40E201600CB06",577
250 DATA "DD7E003005E6300F",709
255 REM
260 DATA "1004E60707070610",522
270 DATA "ED44DDCB00762002",681
280 DATA "C6024797D0FB1F30",971
285 REM
290 DATA "FA70F63003FB10FE",1479
300 DATA "7803FB1520D02CD0",1111
310 DATA "230D20C8C13E7FD0",881
315 REM
320 DATA "FE1F30073EFED0FE",1137
330 DATA "1F300D783DE60720",550
340 DATA "0511E0FFDD191090",907
345 REM
350 DATA "3E0403FBFBC92020",980
400 DATA "",0
```



VARDUMP

by Philip W Reynolds

VARDUMP is a 100% machine code variable dump program for any Spectrum Although it is on the large side (1909 bytes) this program offers a number of useful features

1) The code can be relocated to any position in memory
2) Lists all variables, numeric or string and gives looping line information for a *For-Next* loop
3) For numeric and string arrays lists dimensions and then all non zero elements
4) Output to the screen or ZX printer as an option The program automatically presents an appropriate menu
5) Any unprintable strings are printed as "?" to prevent the program crashing
6) Can be called from within a Basic program to aid debugging The *Border Paper* and *Ink* colours are restored on exit

The listing should be typed in as shown except for modifications to Lines 220 and 230 if you do not own microdrives In this case Line 220 should be *Save z$Code 60000 1909* and Line 230, *Verify z$Code 6000 1909*

Once the code has been correctly entered and run it is available for use To reload, simply *Load* to the most convenient location to avoid clashes with the program you want a variable dump of The *Load "name Code location* (tape) or *Load " m" 1 name Code location* (microdrive) command is used To now call the program use *Randomize Usr x* where x is the starting location of the code

Key 's' starts the dump (or 'p' if the printer is attached) and 'q' stops it again before the next variable The scroll? message should be answered in the normal way by pressing a key other than 'n' Key 'r' exits to Basic at the end of the dump or after 'q' is pressed All registers are preserved on exit

I hope you find this program as useful as I have For those daunted by the task of entering all those hex codes copies may be obtained at £1 50, from Philip Reynolds, 6 St George's Square, St Annes-on-Sea, Lancashire FY8 2NY

```
10 CLEAR 59999: LET admin=60000
20 LET ad=admin: LET li=1000
30 RESTORE 1000
40 FOR a=1 TO 39
50 READ a$,ch
60 LET tot=0
70 FOR i=1 TO LEN a$ STEP 2
80 LET hi=CODE a$(i)-48
90 LET hi=hi-7*(hi>9)
100 LET lo=CODE a$(i+1)-48
110 LET lo=lo-7*(lo>9)
120 LET byte=16*hi+lo
130 LET tot=tot+byte
140 POKE ad,byte: LET ad=ad+1
150 NEXT i
160 IF tot<>ch THEN PRINT "Error in line ";li;" Check and re run": STOP
170 PRINT "Line ";li;" O.K "
180 LET li=li+10
190 NEXT a
200 CLS : PRINT "Code in memory "
210 INPUT "Name of code to save ? "; LINE z$
220 SAVE *"m";1;z$CODE 60000,1909
230 VERIFY *"m";1;z$CODE 60000,1909
240 STOP
[illegible]
```

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Cracking the code

David Wallin tackles communications confusion with a brief look at the ASCII codes and their uses.

A Character Code is a method of referencing the characters that a computer can send A number is given to each character and it is that number in its binary form that is sent down the phone line or whatever is being used to link two computers

ASCII is the most common character code there is Other names for it are CCITT V3 and International Alphabet 5 Probably the next most common code is EBCDIC, Extended Binary Coded Decimal Interchange Code which is used extensively on the IBMs and compatibles

As you can see its a seven bit code that means that the binary versions of each code contains seven bits (bit binary digit) The eighth bit can be used for parity or may always be one or always be 0 Here I have kept it set to 0

ASCII codes from 0 to 32 decimal) and code 128 are special control codes and are usually generated by ↑(CHARACTER). Some of the codes though, often have their own key for example the tab key Many computers have, or will have a TAB key, which will return an ASCII value of nine (decimal) which is the ASCII TAB code And although it can be generated by ↑I, more and more computers are having a TAB key as standard

The definitions of the SI codes are as follows

NUL

NUL1 – This is a blank or null character When a NUL is sent time passes but no information is changed Bulletin Boards can be asked to send from 0 to 50 NULs after each return different computers need different number If you don't know how many you need try from 5 to 10

SOH

Start Of Header – when sent this means that what is about to come is the header to a block of information

STX

Start of TeXt – this marks the end of the header and the beginning of the information (text) that it was the header to

ETX

End of TeXt – this marks the end of a piece of information (text)

EOT

End Of Transmission – this is sent to indicate that transmission has ended

ENQ

ENQuiry – sent by the host computer to ask the remote computer to send some information Used on Prestel and Viewdata boards to ask for the customer ID which is often stored in the remote computer's memory and is sent automatically on reception of an ENQ Often thought of a the question Who?

ACK

ACKnowledge – sent to confirm that a block of information has been received correctly Used on XMODEM data transfer to say that the checksum test worked

BEL

BELl – when received this emits a bleep on the comuter and is sometimes used for a Pager' to the SYSOP to indicate chat mode has been requested

BS

Back Space – this code will move the cursor/print head back one space but NOT delete the character Often on a keyboard labelled as CANCEL or ←

HT

Horizontal Tab – this moves the cursor to the right a set number of places It has the same effect as the TAB key found on some computers Some comuters do not allow setting of tab positions and move by either 9 to 7 places.

LF

Line Feed – Moves the cursor/print head down a line but the column stays the same Most printers have an LF button

VT

Vertical Tab – this moves the cursor/print head to a specified position Similar to HT

FF

Form Feed – Moves the print head to the

Binary Value	Decimal Value	Hexadecimal Value	ASCII Character	Keyboard Character
00000000	0	0	NUL	↑@
00000001	1	1	SOH	↑A
00000010	2	2	STX	↑B
00000011	3	3	ETX	↑C
00000100	4	4	EOT	↑D
00000101	5	5	ENQ	↑E
00000110	6	6	ACK	↑F
00000111	7	7	BEL	↑G
00001000	8	8	BS	↑H
00001001	9	9	HT	↑I
00001010	10	A	LF	↑J
00001011	11	B	VT	↑K
00001100	12	C	FF	↑L
00001101	13	D	CR	↑M
00001110	14	E	SO	↑N
00001111	15	F	SI	↑O
00010000	16	10	DLE	↑P
00010001	17	11	DC1	↑Q
00010010	18	12	DC2	↑R
00000011	19	13	DC3	↑S
00010100	20	14	DC4	↑T
00010101	21	15	NAK	↑U
00010110	22	16	SYN	↑V
00010111	23	17	ETB	↑W
00011000	24	18	CAN	↑X
00011001	25	19	EM	↑Y
00011010	26	1A	SUB	↑Z
00011011	27	1B	ESC	↑[
00011100	28	1C	FS	↑\
00011101	29	1D	GS	↑]
00011110	30	1E	RSL	↑
00011111	31	1F	US	↑–
00100000	32	20	SP	SPACE
01111111	127	7F	DEL	↑Delete

top of the next piece of paper on the printer

CR

Carriage Return – this moves the print head to the start of the current line. It does NOT perform an LF as well

SO

Shift Out – used to signify that the following characters are not ASCII standard. Applies to all following text until a SI is reached. Usually used to add graphics to the character set. Codes 0-31 remain the same

SI

Shift In – signifies that the following characters are standard ASCII. Used to end a block of SO characters

DLE

Data Link Escape – Changes the meaning of the next set of characters. Only graphics (values greater than 127) and transmission on control characters can be used in a DLE sequence

DC1 DC2 DC3 DC4

Device Control Number (devices are numbered one to four – four characters used in the control of other devices. DC1 – DC3 have well known uses

DC1 *Xon* (handshaking)
DC2 *Tape*
DC3 *Xoff*

NAK

Negative AcKnowledge – sent to say that a block of information has been received with errors and to request a re-transmission. Used on *XMODEM* data transfer to say that the checksum test failed

SYN

SYNchronus idle – used in synchronus transmission while no data is being sent to enable the computers to stay synchronised

ETB

End of Transmission Block – indicates that transmission of a block of data has ended

CAN

CANcel – informs the other computer that it has just received an error. Should not be confused with the keyboard key, CAN which usually generates BS

EM

End of Medium – indicates that the end of a medium (eg a tape) has been reached

SUB

SUBstitute – used to substitute a character which was sent wrongly

ESC

ESCape – used to change the meaning of the next character only. Used in communications packages to enable the user to perform an operation such as *XMODEM* transmit without using up valuable ASCII control codes which are needed

FS

File Separator – ends a block of information called a file

GS

Group Seperator – ends a block of information called a group

RS

Record Seperator – ends a block of information called a record

US

Unit Separator – ends a block of information called a unit.

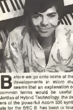
DEL

DELete – erases an unwanted character. Effectively, it moves the cursor/print head back one character, prints a space and then moves back again

The Return/Enter key on your computer usually has an ASCII value of 13 which is [CR] not [CR] [LF]. So therefore the host computer must not only echo back a [CR] when you type one but an [LF] as well. This is called an [NL], New Line and is ASCII 11 followed by ASCII 13. When in BASIC or another language, the OS will automatically give an [NL] when Return/Enter is pressed

All of the codes can be used locally as well. That means that they can be typed on your computer and affect your computer

To the person who just uses a modem and computer to access Micronet and the odd Bulletin Board, the past 2 weeks will have been rather boring. I would like to apologise to those people concerned, before they get a chance to write and complain! Seriously though, to the person who uses comms seriously an ASCII list and control codes list. It is invaluable. Although most books and manuals have one, it's always in the back, when you need the book open at the front! So a separate list is very useful



Sound terminology

MARK JENKINS on micro music terminology and Spectrum packages . . .

Before we go onto some of the latest developments in micro music it seems that an explanation of some common terms would be useful. Chris Jordan of Hybrid Technology, the developers of the powerful Acorn 500 synth module for the BBC B, has been in touch with some sections from the handbooks of the 500 and its AMPLE programming language, so with some adaptation, here's the first part of our micro music glossary.

ACCIDENTAL
In conventional music notation the temporary modification of the pitch of a note, either a *semitone* up (sharp) or down (flat).

ADSR
Simple description of a standard *envelope* or change in a parameter over time standing for *attack, decay, sustain, release*. Applied to an *amplifier* to control volume or to a *filter* to control tone.

AMPLITUDE
Technical term for Level.

ATTACK
The build-up in *amplitude* of a parameter from the start of a note (when a key is pressed or a command sent) to its highest level. Attack is a measure of time – a fast attack means a sound begins suddenly like a piano, a slow attack means it begins gradually, like a string section.

ANALOG
Using conventional electronics to produce sounds: analog synths (Roland, Korg, Sequential) can be digitally controlled and MIDI-compatible, but tend to sound fatter and smoother than digital synths (Casio, Yamaha).

BAR
A division of musical time. Every bar has the same total of note lengths, and so if the *tempo* is steady, each bar lasts for the same amount of time.

BAR LINE
Score mark which ends one bar and begins the next.

BEAT
Shortest musical division in use at any time.

CHANNEL
Various applications: on the Acorn 500 refers to a single sound generator with its own pitch and stereo position. In MIDI applications to the 16 coded transmission lines which can each control one or more synthesisers polyphonically; on a mixing desk to an input for one instrument and so on.

CHORD
Two or more notes sounded together, the relationships of the notes determine the type of chord – major, minor, seventh, and so on.

CHORUSING
Thickening a sound to give the impression of more than one instrument playing the same notes. Can be achieved by programming a second *voice* with slight *detuning* or by adding a hardware chorus unit such as a *delay line*.

DECAY
The decreases in amplitude of a parameter after the end of the *attack* phase. Decay is a measure of time, and the amplitude decays to the *sustain* level. A piano has a long or slow Decay, since the notes fade while the keys are still held down; an organ sound has no decay since it stays at the same volume for as long as a key is held.

DELAY LINE
Hardware intended to store a sound temporarily and re-mix it with the original. Creates echo, chorus and various other effects.

DE-TUNING
Slightly altering the pitch of one of a pair of sounds, by a fixed or variable amount, to create thicker sounds.

ENVELOPE
Description of the change in level of a parameter over time. On a synthesiser, controlled by an Envelope generator (EG), or ADSR, can be applied to volume, filtering pitch, *pulse width* or other parameters.

EQUALISATION
Time-honoured term for the control of tone achieved with a graphic or parametric equaliser, or most simply with bass and treble controls on an amplifier.

More of the Micro Music Glossary next week. Now on to some news from XRI Systems.

XRI now have several MICON MIDI products for the 48K Spectrum and are about to launch their Amstrad 8256 range. Already available: the Step Time Sequencer uses XRI's MIDI Interface (£59.95) to compose music in eight tracks of up to 2,900 steps for a total of 26,200 steps.

Notes are entered from the keyboard of a MIDI synth and timings are entered from the computer. Single notes or chords can be entered; sequences can be saved to cassette or microdrive and tracks can be assigned to different MIDI channels on playback.

The package synchronises to MIDI or a clock pulse, but XRI also sell three sync boxes – MIDI Tape/Tape-MIDI for £55.95, MIDI-DIN Sync/DIN Sync-MIDI for £49.95, and MIDI Tape & DIN SYNC/Tape-MIDI & DIN Sync for £65.95.

Other products include a Yamaha DX7/TX7 synth graphic voice editor (£24.95), a Casio CZ synth graphic voice editor (£22.95), a DX7/TX7 voice library with 224 new sounds and tape save (£24.95), a Roland Juno 106 synth Toolkit editor/library (£19.95) and a Database System for patch and song tape save from most synths and drum machines (£22.95).

The new Multi-Tracker program records eight polyphonic tracks in real time and can auto-correct your playing synchronised to a metronome beat, a drum machine, a MIDI unit or a previous track. Bars can be added, inserted, deleted and repeated to create a complete song and different MIDI channels can be assigned to each track on playback.

Microdrive or Opus Discovery may be used to store sequences which can be over five minutes long. Price is £24.95 with an expanded version coming up for £16 (exchange) or £38.95 for the two programs bought together.

XRI Systems, 10 Sunnybank Road, Wylde Green, Sutton Coldfield, West Midlands B73 5RE, 021-382 6068.

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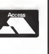
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New Releases

John Cook looks through this week's new arrivals

Amstrad

Program *Monsters of Murdach* **Type** Text Adventure **Micro** Amstrad CPC **Price** £7 95 (tape) £14 95 (disc) **Supplier** Global Software PO Box 67, London SW11 1BS

Program *Monsters of Murdach* **Type** Text Adventure **Micro** PCW 8256/8512 **Price** £19 95 **Supplier** Global Software PO Box 67, London SW11 1BS.

Program *Harvey Headbanger* **Type** Arcade **Micro** Amstrad CPC **Price** £1 99 **Supplier** Firebird Software Wellington House Upper St Martins Lane, London WC2

Program *Knight Games* **Type** Arcade **Micro** Amstrad CPC **Price** £8 95 (tape) £14 95 (disc) **Supplier** English Software 1 North Parade, Parsonage Gardens Manchester, M60 1BX

Program *Amstrad Shuffle* **Type** Strategy **Micro** Amstrad CPC **Price** £4 95 **Supplier** Alpha Omega 9 Kings Yard, Carpenters Rd, London E15

Program *Instant Access* **Type** Utility **Micro** Amstrad CPC **Price** £29 95 **Supplier** Minerva Systems 69 Sidwall St Exeter Devon, EX4 6PH

Program *Random Database* **Type** Utility **Micro** Amstrad CPC **Price** £39 95 **Supplier** Minerva Systems 69 Sidwell St Exeter Devon, EX4 6PH

Program *First Base* **Type** Utility **Micro** PCW 8256/8512 **Price** £29 95 **Supplier** Minerva Systems 69 Sidwell St, Exeter Devon, EX4 6PH

Atari ST

Program *Atari DB Calc* **Type** Utility **Micro** Atari ST **Price** £?? ?? **Supplier** Robtek Unit 4 Isleworth Business Complex St Johns Road, Isleworth Middx TW7 6NL.

Program *Cards* **Type** Strategy **Micro** Atari ST **Price** £19 95 **Supplier** Microdeal, PO Box 68, St Austell Cornwall PL25 4YB

I quote, *'Cards* offers a refreshing break from arcade-style games ' I can remember getting the same sinking feeling when a company representative once intimated of his game I think people are getting tired of good graphics and sound

Still, Microdeal do deserve some credit for getting hold of great quantities of American ST software (all written by Michtron so far) and bringing it over to the UK – even if this blunderbuss approach is sometimes off the mark

Cards will grab hold of your 68000 based state-of-the-art machine and allow you to play Solhaire, Klondike Poker Squares and Cribbage (against the computer or by yourself as applicable) or play Blackjack (Pontoon) with up to four others against the machine The graphics are satisfactory and it's nice to see that full *use* is made of the mouse for selecting options cards, etc

Two things count heavily against the package – explanation of the rules are minimal and the thing doesn't play poker An American selection of card games that doesn't include Poker! The Moral Majority have got a lot to answer for – I can *see* Doc Holliday turning in his grave For ST greenhorns only I would say – whatever – it's to be played with the boots firmly off

Pick of the week

Leader Board

Program *Leader Board* **Type** Arcade/Strategy **Micro** CBM 64 **Price** £9 95 (tape) £14 95 (disc) **Supplier** US Gold Unit 10 The Parkway Industrial Centre Heneage St Birmingham B7 4LY

It's been an above par season for golf games – recently the creditable *Golf Construction Set* (reputedly coded by Hungarian programmers who had never even set eyes on a golf course), now topped by *Leader Board* from US Gold

I'd be surprised if none of the American Access team played golf – it's a surburban obsession over there And that obsession has shown itself up in the accuracy of the simulation and the atmosphere of tension and excitement that *Leader Board* can create

Without going into the finer details of the controls (for that see the full review next week) the game manages to combine playability with a crucial need for intense concentration and timing

Like the real game sloppiness is punished severely as the smallest hint of slice or hook can send your ball whizzing off into the water Water? Yes water (and the excellent sound effect that accompanies its demise into the deep) will become an all too familiar companion on the way round this particular golf course, as it seems to be played mainly on a series of islands Think of Wentworth flooded up to depth of about five feet and you've got the idea.

Up to four players (the more the better) can battle it out over four 18-hole courses – and there's no denying that this is by far the best golfing simulation to date Access have succeeded in capturing the claustrophobic coiled excitement that attracts the crowds

Of course, it's not going to improve your handicap any but if you want to know what it feels like walking into the 18th green with $100 000 riding on a fifty foot putt – this is the closest most of us are going to get

Program *Introduction to Logo on the Atari ST* **Type** Educational **Micro** Atari ST **Price** £19 95 **Supplier** Microdeal, PO Box 68 St Austell, Cornwall, PL25 4YB

BBC B/Electron

Program *AMX Zap Zone* **Type** Arcade **Micro** BBC B **Price** £4 95 **Supplier** AMS 166-70 Wilderspool Causeway, Warrington, WA4 6QA

Program *AMX Mind Games* **Type** Strategy/Educational **Micro** BBC B **Price** £14 95 (disc) **Supplier** AMS 166-70 Wilderspool Causeway, Warrington WA4 6QA

Program *Thrust* **Type** Arcade **Micro** BBC B/Electron **Price** £7 95 (tape) £11 95 (disc) **Supplier** Superior Software Dept TH1 Regent House Skinner Lane Leeds LS7 1AX

Program *AMX Pagemaker* **Type** Utility **Micro** BBC B **Price** £?? ?? **Supplier** AMS Wilderspool Causeway Warrington WA4 6QA

C16/Plus 4

Program *C16 Greatest Hits* **Type** Compilation **Micro** C16 **Price** £7 95 **Supplier** Melbourne House 60 High St Hampton Wick, Kingston upon Thames Surrey, KT1 4DB

Program *Booty* **Type** Arcade **Micro** C16/Plus 4 **Price** £1 99 **Supplier** Firebird Software Wellington House, Upper St Martins Lane, London WC2

CBM 64

Program *Floyd the Droid* **Type** Arcade/Strategy **Micro** CBM 64 **Price** £9 95 **Supplier** Ariolasoft UK 68 Long Acre, Convent Garden London WC2E 9JH

Program *Databasis* **Type** Utility **Micro** CBM 64 **Price** £9 95 **Supplier** Ariolasoft UK, 68 Long Acre Convent Garden, London WC2E 9JH

Program *Maps (Britain)* **Type** Educational **Micro** CBM 64 **Price** £9 95 **Supplier** Ariolasoft UK 68 Long Acre Convent Garden London WC2E 9JH

It s a pity that so much educational software that passes through seems to be of the simple question/answer multiple choice variety, without using the computer more imaginatively At least it does make the exceptions stand out more – such as *Maps Britain*

What you have here is essentially a program that will teach a child the basic place name geography of the United Kingdom (and Eire) without tears

The best feature is a game which has you flying a helicopter over a scrolling map of the UK You are asked to visit a series of locations within a strict time limit – the problem is that the map does not contain place names and only marks the very major cities (You are given a clue in that your target location will flash if you pass very near it The more locations you get to (identify) the more points you get – and if you visit enough extra time is added but now the place names are more obscure (Where the hell is Milford Haven anyway?)

Such competition is ideal carrot and stick lodder to get anyone studying their atlas Other features are a search facility (which will look for any particular town you enter and display it on the map if it is in the program s database) and a straightforward quiz section which will point to an area and ask what county it is for example

I wasn't too impressed with the latter – any program that rejects Devon as an answer, when what it wanted was 'Devonshire cannot be said to be without fault – nevertheless, for the helicopter game alone this is excellent education amusement.

Program *Touchdown Football* **Type** Arcade **Micro** CBM 64 **Price** £9 95 (tape) £14 95 (disc) **Supplier** Ariolasoft UK, 68 Long Acre Convent Garden London WC2E 9JH

Program *Murder on the Mississippi* **Type** Adventure **Micro** CBM 64 **Price** £14 99 (disc only) **Supplier** Activision Activision House 23 Pond St London NW3

Program *Speed King* **Type** Arcade **Micro** CBM 64 **Price** £1 99 **Supplier** Mastertronic, 8-10 Paul St London EC2

Program *Ninja Master* **Type** Arcade **Micro** CBM 64 **Price** £1 99 **Supplier** Firebird Software Wellington House Upper St Martins Lane London WC2

Program *Knight Games* **Type** Arcade **Micro** Commodore 64 **Price** £8 95 (tape) £12 95 (disc) **Supplier** English Software 1 North parade Parsonage Gardens, Manchester, M60 1BX

MSX

Program *Scrabble* **Type** Strategy **Micro** MSX **Price** £9 95 **Supplier** Virgin Games, 2-4 Vernon Yard Portobello Rd, London W11 2DX

PCW 8256/8512

Program *Monsters of Murdac* **Type** Text Adventure **Micro** PCW 8256/8512 **Price** £19 95 **Supplier** Global Software PO Box 67 London SW11 1BS

Program *Monopoly* **Type** Strategy **Micro** MSX **Price** £9 95 **Supplier** Virgin Games 2-4 Vernon Yard Portobello Rd London W11 2DX

Program *Cluedo* **Type** Strategy **Micro** MSX **Price** £9 95 **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Rd, London W11 2DX

Program *First Base* **Type** Utility **Micro** PCW 8256/8512 **Price** £29 95 **Supplier** Minerva Systems, 69 Sidwall st Exeter Devon EX4 6PH

Spectrum

Program *Crimble* **Type** Adventure **Micro** Spectrum **Price** £2 20 **Supplier** MicroTech, 66 Whitley Spring Cres Ossett W Yorks WF5 0RF

Program *2001½ A Space Idiot* **Type** Advenkture **Micro** Spectrum **Price** £2 20 **Supplier** MicroTech, 66 Whitley Spring Cres Ossett, W Yorks WF5 0RF

Program *Rebel Star* **Type** Strategy **Micro** Spectrum **Price** £1 99 **Supplier** Firebird Software Wellington House Upper St Martins Lane London WC2

You don t expect to see strategy games turning up on a budget label as a rule but in the latest batch of releases from Firebird lurks one such beast – *Rebel Star* Played as a one or two player game (in the one player version the Spectrum gets to play the defenders) it depicts the assault on Moonbase Delta by a mixed bunch of Rebels and assorted droids while the defenders (mainly droids) do their best to keep Kurt Levine and his pals out

Each player takes his turn to move all, some or none of his forces on a scrolling playing area about six screens by three All activity ie, movement combat using objects takes a certain number of 'Action Points' – and when a piece has used up all of its action points for that turn it's on to the next one – a concept familiar to most wargamers

Overall there s more to it than originally meets the eye It s obviously been carefully programmed – and despite the less than impressive graphic display lovers of computer wargames are unlikely to find they have wasted £1 99 on this one

Program *Conquest* **Type** Arcade **Micro** Spectrum **Price** £2.95 **Supplier** mastertronic, 8-10 Paul St London EC2

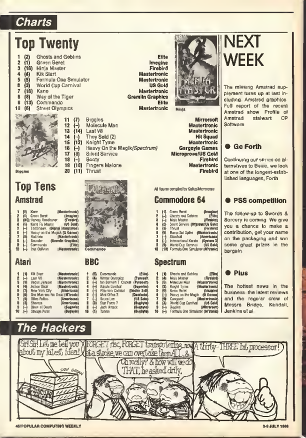
Program *Poster Machine* **Type** Utility **Micro** Spectrum **Price** £5 95 **Supplier** Softcat, PO Box79 Macclesfield Cheshire SK10 3NJ

Program *Posh-List* **Type** Utility **Micro** Spectrum **Price** £2 95 **Supplier** Delterho Software, 12 Ennersdale Rd London SE13 5JD

QL

Program *Peintre* **Type** Utility **Micro** QL **Price** £14 95 **Supplier** Reo Promotions, 28 Waverley Grove London N3 3PX.

Program *Nucleon* **Type** Utility **Micro** QL **Price** £10 95 **Supplier** Reo Promotions, 28 Waverley Grove London N3 3PX



Charts

Top Twenty

1	(2)	Ghosts and Goblins	Elite
2	(1)	Green Beret	Imagine
3	(16)	Ninja Master	Firebird
4	(4)	Kik Start	Mastertronic
5	(5)	Formula One Simulator	Mastertronic
6	(3)	World Cup Carnival	US Gold
7	(18)	Kane	Mastertronic
8	(8)	Way of the Tiger	Gremlin Graphics
9	(13)	Commando	Elite
10	(6)	Street Olympics	Mastertronic
11	(7)	Biggles	Mirrorsoft
12	(–)	Molecule Man	Mastertronic
13	(14)	Last V8	Mastertronic
14	(–)	They Sold (2)	Hit Squad
15	(12)	Knight Tyme	Mastertronic
16	(–)	Heavy On the Magik *(Spectrum)*	Gargoyle Games
17	(9)	Silent Service	Microprose/US Gold
18	(–)	Booty	Firebird
19	(10)	Fingers Malone	Mastertronic
20	(11)	Thrust	Firebird

Ninja

Biggles

Top Tens

All figures compiled by Gallup/Microscope

Amstrad

1	(7)	Kane	(Mastertronic)
2	(5)	Green Beret	(Imagine)
3	(NE)	Harvey Headbanger	(Firebird)
4	(5)	Kung Fu Master	(US Gold)
5	(–)	Tomahawk	(Digital Integration)
6	(–)	Heavy on the Magick	(G Games)
7	(6)	Raiztone	(Mastertronic)
8	(–)	Bounder	(Gremlin Graphics)
9	(–)	Commando	(Elite)
10	(–)	Into Oblivion	(Mastertronic)

Commando

Commodore 64

1	(1)	Green Beret	(Imagine)
2	(–)	Ghosts and Goblins	(Elite)
3	(–)	Ninja Master	(Firebird)
4	(2)	Silent Service	(M'prose/US Gold)
5	(3)	Thrust	(Firebird)
6	(6)	Bump Set Spike	(Mastertronic)
7	(–)	Starshall	(Americana)
8	(–)	International Karate	(System 3)
9	(9)	World Cup Carnival	(US Gold)
10	(10)	Formula One Simulator	(M'tronic)

Atari

1	(1)	Kik Start	(Mastertronic)
2	(–)	Last V8	(Mastertronic)
3	(3)	Vegas Jackpot	(Mastertronic)
4	(4)	Action Biker	(Mastertronic)
5	(7)	New York City	(Americana)
6	(6)	One Man and his Droid	(M'tronic)
7	(8)	Ollies Follies	(Americana)
8	(5)	Shamus	(Americana)
9	(–)	Claws of Death	(Bugbyte)
10	(–)	Savage Pond	(Bugbyte)

BBC

1	(6)	Commando	(Elite)
2	(4)	Winter Olympics	(Tynesoft)
3	(–)	Ian Botham T Cricket	(Tynesoft)
4	(–)	Karate Combat	(Superior)
5	(–)	Phantom Combat	(Doctor Soft)
6	(–)	Mini Office 2	(Database)
7	(–)	Bruce Lee	(US Gold)
8	(3)	Star Force 7	(Bugbyte)
9	(–)	Jack Attack	(Bugbyte)
10	(1)	Tennis	(Bugbyte)

Spectrum

1	(1)	Ghosts and Goblins	(Elite)
2	(4)	Ninja Master	(Firebird)
3	(5)	Molecule Man	(Mastertronic)
4	(2)	Knight Tyme	(Mastertronic)
5	(6)	Green Beret	(Imagine)
6	(–)	Heavy on the Magik	(G Games)
7	(9)	Conquest	(Mastertronic)
8	(3)	World Cup Carnival	(US Gold)
9	(–)	Biggles	(Mirrorsoft)
10	(–)	Formula One Simulator	(M'tronic)

NEXT WEEK

The missing Amstrad supplement turns up at last including Amstrad graphics. Full report of the recent Amstrad show. Profile of Amstrad stalwart CP Software

● Go Forth

Continuing our series on alternatives to Basic, we look at one of the longest-established languages, Forth

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The Hackers



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ZZAP64
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